The Builder.

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*School Architecture.**

RECENT acts of our Legislature may be said to have created a new literature, or to have caused a new branch to spring out of the ancient tree of letters. To meet the demands for sanitary information quite an array of volumes has been produced within the last few years, relating to matters comparatively new to the bookshelf. In the days of three-cornered hats, powder, and pigtails, there were people, indeed, who wrote of "the waters," as did the Irish patriot, Charles Lucas, in 1756; or on "Health," as did the corpulent Cheyne before this; or, earlier still, who disguised polished satire in poems with medicinal-looking titles, as did Sir Samuel Garth, in his "Dispensary," or in witty treatises upon aliments and air, as did Arbuthnot, in the days of Queen Anne; or further back, in the days of broad-leaved beaver and feathers and jewels, who mixed medicine with astrology, as did Nicholas Culpeper, in his "School of Physick," published in the seventeenth century; but it has been reserved for our times to see bulky and handy volumes written on constructional matters affecting the public health. In the old times, it is possible, the learned in such affairs may have made researches for the aid of their own private judgments, but, it is certain, they did not impart the knowledge they acquired to the public. Comparatively modern writers on education, such as Miss Edgeworth or Miss Hannah Moore, do not touch upon the subject. But, in our days, no sooner does a special inquiry elicit discoveries of benefits arising from particular treatment of constructional aids towards the preservation and maintenance of the public health, than straightway the public is put in possession of the facts;—though it may make but small use of them. The recent legislation concerning compulsory education is now bearing fruits in a literary light, and among the first is a volume before us, setting forth the result of the inquiries, researches, and experience of the architect to the School Board for London, Mr. E. R. Robson, as to the best methods of planning school-houses, so as to ensure the greatest amount of health and comfort for the pupils, and convenience and general aid to the maintenance of discipline for the teachers. There is, however, either a slight reservation, or an inadvertent blemish in this work, of which we would complain at the outset, as it places it at variance with this rule of complete disclosure of new truths, or fresh facts. We are told that elementary education has reached the highest excellence in Holland and Switzerland; yet there is but the barest information given concerning the school-houses of these countries. This is the more to be regretted, because the English system of using the services of pupil-teachers is stated to have points of resemblance to the Dutch and Swiss systems, while it is diametrically opposed to the German plan. Curiously, more details are given of the German system, and of German school-houses, than of any others, yet the Germans have not the recommendation of having advanced education beyond the point attained by the Swiss and Dutch, nor the special claim of having developed a system similar to our own to a degree nearer perfection than we have done. We suggest, therefore, that further particulars of the school-houses in use by those who have made the greatest progress should be given in any future edition.

This blemish, after all, is probably but the result of the difficulties of accumulating in a given time data scattered over a continent. A great deal of information has been gathered which must have appeared of the highest value till more important facts were found, and which, till we are certain of better things, will be of great use to us. Hitherto, the principal guide at the service of those about to build elementary schools in this kingdom has been the sheet of printed instructions issued by the Education Department of the Privy Council. It is not to be supposed that these recommendations were drawn up without examination of the plans in use in other countries; of those proposed for infant schools by Mr. Wilderspin, or suggested by other enthusiastic educators; but, though capable of extension and contraction, they are not always applicable. From the instructions of our own Government, he passes on to the opinions of the authorities in other countries. American, Irish, Scotch, French, German, and Austrian schools are depicted and described by him. And, further, he gives full particulars of new schools erected by the London School Board, in which every worthy adaptation is presumed to be present, with every other condition calculated to insure the nearest approach to perfection attainable under the given circumstances.

By way of giving the recommendation due to Mr. Robson's work, we will inform our readers of what has been done in the planning of these schools. But before doing so, to understand the intricacies of the task better, we will glance at some of the fields in which he culled his information, in which different systems are at work, all described by him, and from which it is open to all to adopt arrangements found to be useful and healthful. It will be sufficient for this purpose to mention regulations and plans in use in America, Germany, and Austria.

The Americans favour the system of mixing the sexes in their primary schools. They prefer single desks and seats, or dual desks and seats. They do not object to several stories for their buildings. Some rise to five and six stories, the lowest being devoted to the youngest children; and the rest, one after another, to those of successive ages. With them a school-room is generally one vast level chamber, with a teacher's seat raised on a platform in the centre of one side of it. Occasionally, this area is convertible into several class-rooms by means of sliding partitions, as in the Newton Primary School, Tasker School, and Hollingsworth School, Philadelphia, and in Melon-street School, Pennsylvania. Sometimes the girls sit on one side of the school-room, and the boys on the other, when it is not uncommon to transfer a guilty individual of either sex from his or her own seat to one on the other side of the room, by way of punishment. There are "coloured schools" for the descendants of the enslaved Africans. Women are frequently employed as teachers.

The Germans do not mix the sexes. They have no large schoolroom. A series of class-rooms, with an adult schoolmaster in each, branches off from a central corridor. Schools on the best scale have, in addition, an *aula*, or large hall for the conduct of the periodical public examinations, which are part of the educational system; but it is not used for the purpose of simultaneous instruction. The school-houses are often three stories high, the lowest, as in America, being devoted to the youngest children. It is considered a matter of the greatest importance that the light should be admitted on the left side of a pupil, so that his hand should not cast a shadow on his book or slate. No windows are admitted that infringe this rule. An eastern aspect is advocated, and a northern one only valued for drawing-classes. Pupils commence their compulsory education at six, and complete it at fourteen years of age. Sixty children are considered as many as one master can instruct. There are no female teachers; nor any pupil teachers. The authorities of Wurtemburg appear to have given special attention to minute details. They have recently published a decree to the effect that the sexes are not to be mixed; that no schoolroom may be longer than 12 metres, nor lower than 3 to 4 metres; that no paint containing poisonous matter is to be used on the walls or furniture; that earthenware stoves are to be preferred to iron; that the temperature is not allowed to get below 62 degrees, and that the pupils are not to attend in the afternoon when it has risen to above 77 degrees in the forenoon; that there must be good light and ventilation, a wash-bowl, towel, and cloak-room; that the premises are to be swept daily, and scoured quarterly; and that any corporal punishment is to be inflicted with a thin switch half a metre in length. The inspection of the German school-houses, 6,000 in number, is placed in different hands from that of the progress of the pupils. No public school, we understand, is considered complete without its Turnhalle, or hall fitted with apparatus for gymnastic exercises. The König Wilhelm Gymnasium, Berlin (of which we are enabled to repeat the view given in the book, see p. 457), must be looked upon as a model establishment, and here there are 20 class-rooms provided for 900 pupils.

In Austria the newest and best school-houses consist of sets of class-rooms arranged round a central quadrangular court. Each class-room is intended to receive 40 or 60 pupils, though in a recent instance one has been made to hold 100 children. As in America and Germany, no value is attached to the use of one-storied buildings only. Nor in the primary schools is the large hall an indispensable matter; and, as in the case of the lower schools in Germany, it is much more frequently absent than present. The staircases, wisely, are seldom more than 5 ft. wide, and an entrance-lobby, 6 ft. 6 in. wide, is considered to be planned upon a liberal scale. There are several new elementary schools in Vienna, built on the central court plan. One, designed by Herr Hansen, will serve as a sample. The court is 30 ft. square. It is open to the full height of the building, where it is then covered in with a glass roof. The ground-floor is used as a play-ground. It is surrounded by a corridor, on each of the three stories, on its four sides. From these corridors open the various class-rooms, and in each of them are to be found latrines and drinking-fountains. The Imperial Gymnasium at Vienna is also framed on this plan, but the central quadrangle is not covered in. The *aula* is used as a chapel.*

When the reader bears in mind that our English system employs pupil teachers, who teach classes under the eye of the master, he will see that neither the German nor Austrian arrangement of buildings offers models for imitation. The vast chamber of the American schools is but the large room advocated in our own country by Dr. Lancaster as sufficient accommodation for a thousand pupils taught on his method. The sliding partitions are novelties, but whether they are advantages is open to grave doubt. It has to be seen that they can be easily worked, not easily put out of order, and that they exclude the sound of what is passing around sufficiently,

* "School Architecture: being Practical Remarks on the Planning, Designing, Building, and Furnishing of School-houses." By Edward Robert Robson, F.R.I.B.A. With more than 300 illustrations. London: John Murray, Albemarle-street. 1874.

* See p. 460.

before they are generally adopted. It is necessary, then, in Mr. Robson's words, to "build on our own foundations."

This is a rough-and-ready outline of the way he recommends school builders to set to work. First, decide the number of departments, the number of children in each department, and determine the number of class-rooms. Calculate that the code of the Education Department requires a certificated teacher and a pupil teacher for sixty children, and a second pupil teacher for every additional forty children, and either another certificated teacher or two pupil teachers for every additional eighty children. Calculate not less than 80 cubic feet of space for every child attending the school, to determine the size of the large schoolroom. Then consider whether the building shall be of one, two, or three stories; whether the infant-school shall be placed under the others, or apart; where the entrances and staircases shall be, so that the infants and girls be not in the boisterous way of the boys; how to secure side lighting, or as much of it as possible; whether to warm and ventilate by open fires or otherwise; where the latrines shall be, so as to be near enough and yet not too near; where the playground is to be, so as to secure sunshine in it; and whether a master's house is to form part of the scheme. Before proceeding to plan the school-house, decide, too, the kind of school-desk to be used. If the desk question had been first settled in every instance, many a school-house would have been more commodiously planned with reference to size, doors, windows, and fireplaces. He recommends not the long desks hitherto advised by the Education Department, but the dual desks. The use of these desks is one of the steps made in advance in Holland. The Dutch desks are fixed to frames, and placed six and seven rows deep; and they are so constructed that the front of one forms the back of another before it. He would improve upon this arrangement by not placing them more than five deep, on the teacher's account; by making each desk independent of another so as to avoid the liability to be shaken that their continuity involves; and by an alteration in the form productive of greater ease to the pupils. He delineates, with every detail, this form, which is that adopted by the School Board for London.

We will now turn to Mr. Robson's account of some of the new schools built by this Board. At the close of the year 1873, there were 86 new schools, either completed or under weigh. It was found that very large schools covered a district so large as to involve long distances for many of the pupils to walk. This, in the case of very young children was a disadvantage too serious to be overlooked. A medium size, or accommodation for about 800 children, was therefore preferred, except in a few instances, where it was resolved to try the working of a close approximation to the foreign method, as in the Jonson-street Schools, Stepney, and the New North-street Schools, Shoreditch. For a style of architecture, Mr. Robson recommends the "good and thoughtful brickwork" of the days of the Stuarts and early Georges. The buildings of those times, he contends, approach nearer to the tone of the present day, and they also set the example of truth in construction and honesty in workmanship. Four new schoolhouses have been built in accordance with this feeling; one in Wornington-road in the north-west; another in Aldenham-street, near St. Pancras Railway Station; a third in Orange-street, Southwark; and a fourth in West-street, Hackney.* Although all built in the same style of architecture, and with the intention of providing for the same method of teaching by the aid of pupil teachers, and of using every available experience gained from the consideration of Continental schools, the sites have so commanded the arrangements that they all differ. In the first, the Infant Schools, which are of one story, are placed back to back, nearest to the road of approach. This is to admit of elder girls leaving their younger brothers and sisters on the way to the more advanced departments. The infants have a covered playground under the upper schools. The boys have an entrance in a lane on the opposite or south-east side of the site, as well as a playground. Part of the ground-floor being used, as stated, for a covered playground for the infants, and the rest for the teacher's residence, the boys occupy the first-floor, and the girls the second. The girls are placed above the boys to secure the space on the mezzanine floors for their clothing. Rarely does an elementary schoolboy possess an overcoat, consequently the accommodation required in the boys' cloak-rooms is less than that wanted by the girls. Here no space is wasted in corridors, there are double exits, as many class-rooms as classes, all counted as "points" in a model school, but, unfortunately, no side-lights. In the Aldenham-street school there is a corridor, but it is utilised for caps and cloaks, but there is the extra "point" of side-lighting for the schoolrooms. The Orange-street schools are set so far back that the covered approaches are long enough to serve as playgrounds. Here there is a sliding wooden partition used to shut off the gallery in the infant schoolroom, though permanent divisions are preferred for the class-rooms of the boys' and girls' schools above it. In the Hackney schools covered playgrounds had to be abandoned as impossibilities, and it was not found possible, in the mixture of galleries and desks, to prevent the scholars in the infant school from facing each other. As a rule, it has come, now, to be looked upon as the right thing to raise the boys' and girls', or graded, schools upon piers, so as to provide a covered playground below them, and to keep the infant school on the ground floor.*

A school at Haverstock-hill has been built of only one story in height, in which the girls' and boys' schools, with their class-rooms, surround a spacious inner court, which is covered in and intended to be used both for a girls' playground and for a hall of assembly for lectures, distribution of prizes, &c., and in which the infant school and master's house form separate blocks adjacent. The lighting here is not uniformly on the left of the pupils. Thus, it is seen that it seldom happens that every advantage can be obtained in one set of schools, and the School Board must not think itself ineffective, or unfortunate, if it can do no more than distribute over the aggregate of buildings the numerous contrivances and arrangements that constitute perfection; giving to each as many as practicable. If we add that some of the new schools, externally, are wonderfully ugly, it is not with the view of finding fault with work done under great pressure, but to prevent the assumption that nothing better is desired.

An important chapter on school furniture and apparatus has been written for the work by Mr. Moss, clerk to the Sheffield Board of Health, who accompanied Mr. Robson on a tour of school inspection through Belgium, Germany, Austria, Switzerland, and France, in the spring of last year. In this the desk question is again discussed, and the opinions of physicians, architects, and school professors mentioned; and the palm is given to those intended to seat scholars in pairs, to which it appears the Germans are now likewise tending, as they are adopted in the new Victoria school for girls in Berlin. Among minor details, Mr. Moss mentions that the blue linen of which workmen's blouses are made in France is the approved material for blinds in the London School Board.

In Sweden, gardening forms a part of the educational system. Upwards of 2,000 schools have gardens for planting attached to them, and the teachers of elementary schools are obliged to learn gardening. There is a garden attached to the Higher Burgher School at Utrecht, in which botanical specimens are planted, arranged, and classified by the pupils. To some extent, gardens have been apportioned to schoolboys in this country, but rather as a means of recreation than of study. The Duke of Northumberland's School, Alnwick, affords an instance in point. But it is worthy of much wider adoption in country districts.

We have but faintly indicated the general bearing of this useful work. There are topics in it we have not touched upon, or have scarcely alluded to: such as the rise and progress of physical education in Germany, with its Turn-halles and their fittings, or the condition and purposes of industrial schools. We have simply sought to acquaint our readers interested in scholastic matters generally, and school architecture specially, that they will find a fund of new matter presented to their consideration quite worthy of it, the exact measure and manner of which we must leave them to determine for themselves. If we are to accept the statement that the Swiss and Dutch lead the van in educational matters, it might be well to institute further inquiries, officially, and to revise the present rules for planning and fitting schools issued by the Education Department to bring them into harmony with the most advanced views thus ascertained.

* See p. 457.

* Plans, &c., illustrating the various arrangements will be found in previous numbers of the *Builder*.

WOOD-WORKING MACHINERY AT THE INTERNATIONAL EXHIBITION.

CONVERSAZIONE OF THE INSTITUTION OF CIVIL ENGINEERS.

THE *conversazione* given on the 19th inst., by Mr. Harrison, as president of the Institution of Civil Engineers, and Mrs. Harrison, in the galleries of the London International Exhibition, was numerously attended, and admirably well managed. Mr. and Mrs. Harrison received the guests as they arrived, during some hours; refreshments were provided on the most liberal scale, and we shall not be wrong if we say that some thousands of persons participated in the entertainment. The expense of such a gathering must be very considerable, probably not far short of a thousand pounds, and it will one day probably become a question whether or not it is desirable to entail such an expenditure on the acceptance of the office of president of the Institution.

On the evening of which we are speaking, the machinery galleries, with the motive power in full swing, were open to the visitors.

Prominent on this occasion were the wood-working machines, exhibited there by three well-known manufacturers, and we will take the opportunity to give of some of these a few particulars. We have no desire or intention to institute comparisons, or to bring one into prominence before another, but to direct our readers' attention to what may be seen at South Kensington, so that they may examine and judge for themselves.

Messrs. Allen Ransome & Co. (King's-road, Chelsea), taking the names alphabetically, show Ransome's "Patent Complete Joiner," Improved Plain Band Saw Machines, Improved Planing and Trying-up Machines, with endless feed arrangements, Panel-Board Planing Machine, Patent Combined Planing and Moulding Machines, Combined Planing, Shaping, Chamfering, Mortising, and Boring-Machine, Richard's Patent Mortising Machine, Improved Hand-Mortising Machine, Shute's Patent Mitreing Machine, Patent Cleaning-off and Sand-Papering Machine, and Improved Saw-Sharpening Machine. To go a little into particulars, Ransome's "Patent Complete Joiner," has been designed to meet the objections which are urged with more or less justice against the class of machines known as "General or Universal Joiners," and it is guaranteed to be capable of performing the whole of the following operations:—It will work saws up to 24 in. in diameter, and will deep 9-in. deals; it will cross-cut stuff of any length up to 4 in. thick; it will plane, groove, tongue, edge, thickness, and bead, at one operation, boards up to 9 in. wide; it will stick single or double mouldings of any pattern, worked on all four sides, up to 9 in. wide; it will cut circular mouldings of any pattern up to 3 in. wide; it will cut grooves from ⅛ in. to 1½ in. wide; it will cut single or double tenons, and scribe the shoulders at one operation; it will make mortises from ⅛ in. to 1½ in. wide, of any length, in any kind of wood; and it will bore holes from ⅛ in. to 2 in. in diameter,—a formidable list of undertakings. The Saw Spindle is distinct from those which carry the planing and moulding cutters, and hence the operations of sawing and planing or moulding can be carried on simultaneously or separately as at two distinct machines. The Saw Table rises and falls for grooving and rebating; and the Planing and Moulding Apparatus is permanent, and is thus always ready for work. Tenons are formed by cutters, which finish them much more accurately than is the case where saws are employed for this purpose. The Universal Moulding, Shaping, and Recessing Machine is capable of application to a variety of purposes, such as cutting circular or twisted mouldings of any form; sticking circular and straight sash-bars; moulding, rebating, and grooving straight or circular sash-frames; cutting a moulding round raised door-panels; moulding, chamfering, or edging flat ornamental balustrades, &c., to a pattern; forming the housings in string-boards for stairs, and sinking recesses of any form to a pattern. The Combined Planing, Shaping, Chamfering, Mortising, and Boring Machine is suited for planing, shaping, chamfering, and mortising the framing of wagons, carts, and machines constructed of timber, and

it will work either straight or curved pieces of any kind of timber with equal facility. Richard's Patent Mortising Machine can make in soft wood three perfect mortises in a minute without boring, and the chisel drawing the chips as they are produced obviates the necessity for driving the core out after the mortise is formed. The machine will take in stuff as deep as 11 in., and the stroke of the chisel is 4½ in. The Patent Cleaning-off and Sand-papering Machine will clean off doors, shutters, and other joiners' work after being put together, producing a perfectly flat and smooth surface, at the same time sand-papering it ready for painting. The work turned out by the machine is equal to any that can be produced by hand, and the manufacturer asserts that, with one man to work it, it will do at least as much as ten skilled joiners. The work to be cleaned off is laid upon a light cast-iron travelling table, which is fitted with a self-acting forward and return motion, readily governed by a lever handle placed in front of the machine, in a convenient position for the operator. The table passes under a cast-iron disk, which revolves at about 600 revolutions per minute, and which can be readily raised or lowered to suit any thickness of stuff from ¼ in. to 3 in. thick.

Messrs. F. W. Reynolds & Co., of Southwark-street, restrict themselves to hand-power wood-cutting machines, such as improved patent mortising machines, mortar-mixing mills, paint mills, floor cramps, bench cramps, lifting jacks, hoisting crabs, and pulley blocks. Their Imperial Hand-power and Self-feeding Circular Saw Bench, to cut 4½ in. stuff, with a rising and falling spindle for rabbeting, extra saw, and rollers and bearings for long length stuff, will save a good deal of money. This machine is so constructed that it will cut either upwards or downwards. A groove is cut in bench table for the purpose of guiding a cross-cutting and mitreing fence, with which this kind of work may be done with greater accuracy and expedition. In "The Royal" Improved Patent Mortising Machine (nearly three thousand of which have been made), the lever is directly connected, and gives motion to a wrought-iron crank, which, working in a slide attached to the spindle, alternately raises and lowers the cutting tool, instead of the cast-metal rack and pinion wheel hitherto in use, the teeth or cogs of which are liable to cause the chisel to vibrate and make the mortise irregular. It also possesses advantage in the facility given for raising and lowering the spindle for different depths of material; and in the improved means for reversing the chisel. The machine for mitreing, known as Shute's Patent, is a very valuable invention. It cuts edges perfectly true up to an angle of 5½ in. wide. It is stated that the first year's royalties of the working man by whom it was invented amounted to 470*l*. In the London Hand-power Mortar-Mixing Mill, the hopper being filled with the materials, the spindle in the centre of the cylinder, having 14 blades, is set in motion by a wheel and pinion and handle, the mortar being ready for use when discharged from the machine. By the use of this machine, one man and a boy can supply a large number of masons, and the mortar is made much better than in the ordinary way. Their Improved Patent Floor Cramps have come largely into use.

It is surprising to us that these hand-power machines are not used even more largely than they already are. Builders who can avail themselves of steam of course will not employ them, excepting at special jobs where steam cannot be applied, but there are hundreds, probably thousands, of small builders throughout the country who might adopt them with great advantage and economy.

Passing on, we arrive at the location of Messrs. S. Worssam & Co., King's-road, Chelsea. This firm exhibits Worssam's Patent General Joiner; Improved Trying-up Machine; the Four-cutter Moulding Machine; Band-saw Machine; Saw-sharpening Machine; Parquet Surfacing Machine; and the Mitreing Machine. Worssam's Patent General Joiner claims to be capable of performing almost all the varieties of work usually done by manual labour in the joiner's shop, of which we may instance sawing (with and across the grain), mitreing, chamfering, wedge-cutting, tenoning, (single or double), planing, moulding (straight or curved), beading, rebating, grooving, tongueing, and squaring-up; also mortising, boring, curved and irregular work, and innumerable others; all the movements being independent of one another, they may be worked separately or in conjunction, so that the workman can pass from one operation to another without having to make any change in the disposition of his appliances. Thus, he can in a moment pass from tenoning to moulding, moulding to sawing, or mortising, or he may, with the aid of two lads, perform all the diverse actions simultaneously. Tenons are completed at one operation. Mouldings are struck at an independent table, and by self-acting feed. Stuff, up to 9 in. by 3 in., is planed in the same way. Irregular work and curved mouldings are formed to almost any pattern. The Plain Band-saw Machine is for sawing curvilinear work of almost any character. It must be useful to builders and contractors for cutting out twisted handrails, and all kinds of church furniture; to railway carriage builders for sawing buffer heads, brake blocks, and stays for curved carriage roofs; to cabinetmakers, for preparing chair backs and legs. The principle of the machine consists in an endless serrated steel band, or ribbon, passing over two rapidly-revolving pulleys. The material to be operated upon is laid on a table, and manipulated in various directions around the saw, according to the required configuration. Suitable guides, to prevent the saw from buckling, are provided, as well as means to preserve the saw taut, and at the same time allow for contraction and expansion. The Surfacing and Trying-up Machine is an extension of the principle of the ordinary trying-up machine, differing only in the mode of cutting and the arrangement of the cutting tools. For planing large surfaces, such as tops for shop-counters, tables, dressers, pianofortes, also for panels and cleaning off doors after being framed and wedged, it would seem to be indispensable. The cutters are so arranged that stuff can be worked lengthwise or across the grain, without in the least degree injuring or breaking away the edges, and they are easy of adjustment for cutting hard or soft wood. The Four-cutter Moulding and Planing Machine is adapted to plane, groove, tongue, edge, thickness, and bead match-boarding or flooring, cut single or double mouldings, of any pattern, in hard or soft wood, at rates varying from 12 ft. to 40 ft. per minute. The under cutter block is situated in advance of the upper one, giving the stuff under operation a smooth face to work on whilst travelling beneath the cutters. A pressing apparatus is provided to retain the stuff on its seat whilst under the influence of rolls and cutters, and the whole of the intermediate shafts are at one end of the machine, thus presenting a clear front to the operator. The Universal Moulding, Shaping, and Recessing Machine is applicable to a number of purposes, amongst which may be mentioned cutting curvilinear mouldings; sticking circular and straight sash bars; moulding, rebating, and grooving square or circular sash frames; forming mouldings round raised door panels; moulding, chamfering, or edging flat ornamental balustrades to patterns; forming the housings in string-boards for stairs, and sinking recesses of any design. We must now, however, close our present notice. We fully agree with one of the manufacturers in bidding purchasers to remember that the lowest priced machines are not the cheapest. With all wood-working machines it is a great advantage to drive them at as high a speed as possible, not only on account of the extra amount of work which the additional speed enables them to turn out, but because the greater the velocity of the cutting edge of the tools, the more perfect is the work produced. To construct machines so as to work at very high speeds without requiring frequent repairs, demands the very best materials and workmanship, and is necessarily inconsistent with very low prices. The amount of advantage derived from employing wood-working machines depends greatly upon their selection, and the buyer should, if possible, see them in operation before purchasing, in order to satisfy himself that he gets what will best answer his purpose. Machinery, to pay, should be kept pretty constantly at work; and we hear on good authority that a set of the most improved wood-working machines, if judiciously selected for the work they have to do, and kept fully employed, will cover their first cost in the first twelve months. We again advise such of our readers as are concerned to go to the International Exhibition and look into the matter for themselves.

Guildhall, London.—Mr. Deputy Harris has offered to place a stained-glass window in the Guildhall. The subject is referred to the City Lands Committee to make the necessary arrangements. There will then be only one plain window in the Guildhall.

"CASUALS" AT THE ACADEMY.

THE ever-recurring and painfully difficult question of "How best to ameliorate the sad condition of our poor and poorest," has been discussed in many of its phases so frequently in our columns that a sense of particular obligation entails special thanks to all who help to set forth the urgency of this great matter that interests us so much. It is very brave and independent on the part of a rising artist to undertake the exposition in picture form of the squalid misery, the dire abjectedness of the usual "Applicants for Admission to a Casual Ward," for a night of relief from homelessness and starvation, such as the London poor-houses afford (504). Mr. S. L. Fildes paints so finely, so strongly, that his picture must attract attention, however the subject of it may repel; and it is not improbable that his brush may have more potent influences than all the many pens that have done their utmost to describe appalling scenes from the lowest stage of metropolitan existence,—if it can be called existence. The force of the painter's appeal is in his moderation, his direct truthfulness,—thorough reliance on simple but admirably methodical statement, that may be corroborated by enough proof, alas! on any such miserable winter evening, when the snow and the rain, after competing for supremacy all day, compromise their difference in a drizzle of sleet that wets the "dumb, silent horrors" ranged "against that dead wall" to the skin, and chills them to their bones. But only some of them are to be likened to "Sphinxes," for Mr. Fildes has left it an easy riddle to guess that the once respectable have in a measure caused their own "overthrow," and that man can change appearance with some hideous fungus in a wine-vault; and it is easy to see that ignorance, sloth, dishonesty, and profane contempt for the moral, "*Aide-toi, et le Ciel t'aidera*," are so many answers for others being there; and that sickness and misfortune bring to the same dismal plight the more pitiable with the more culpable alike, and which is grievous indeed.

The drunkard, with the out-of-work labourer; the experienced cadger, out-of-luck thief, costermonger, liberated convict; the beggared *émigré*, the street-boy—with nine lives, like a cat, "and doesn't know where he got one on 'em"—with bewildered, despairing wretches who only know they would gladly resign the lives of no value to them, are grouped like so many wandering shades that Charon had refused to ferry; because, poor souls, they had swallowed their last coin, the *obolus* they should have held in their mouths to pay the old boatman's fee. Forlorn women — relicts and derelicts,—famished and shivering children, and some that have lost all likeness to woman, make up the numerous applicants that the police are issuing tickets for, and directing to the ward, for bare shelter, and a modicum of the wherewithal to keep body and soul together.

Ah! ye who never knew what hunger is, and think ten minutes' want of punctuality a crime in cook, and sleep on hair mattress or feather bed,—if your supper agrees to allow you,—think of the thousands who, eating but little to-day, see no prospect of eating anything to-morrow; and whose ideas of prandial appointments are so vague that they cannot remember when last they ate a dinner! Think of the hundreds who, invited by hyenas and wild vultures to eat with them, could hardly say them no!

Mr. Fildes's great picture will be outside the *present* view of the province of art, indeed, if it should work some beneficial change in so sorrowful a state of affairs as that he points to.

It is scarcely credible that the young and lately-bereaved widow, with her babes, should have no better sanctuary offered her than she may share in common with the lowest grade of her sex. There is no system that needs more reform than that of ours on which relief to the poor is administered,—no more hateful and distressing part of it than what applies to the regulations connected with the admission of casuals. But, what better system to adopt, remains one of the most perplexing considerations of the day. It will be at once said that charity never was so bounteous as it is now,—never so well and carefully dispensed. This may be very true; but between charity and parochial help exists little or no analogy. Objection is made to constituting a workhouse too happy a home, on the plea that it would induce those whom circumstances forced to become inmates to remain very willing ones,

and too well satisfied to exert themselves ever to regain independence of it; but it might have quite a contrary effect, in stimulating them to justify the care and kind attention shown them, and to think better for themselves, encouraged by the good opinion of others. It is perfectly wrong to judge all human nature alike, but quite probable that by misjudgment it may become so. Though there are few things in this world immutable, to hope that wealth should cease to bring with it its inverse of poverty, is as reasonable as could be the expectation that victory may be obtained without vanquish; to account health of no more worth than disease; wisdom no better than folly, and strength no power; or to deny that the lame and the blind, the deaf and the dumb, labour under disadvantages. The great friend and the great foe, known to those who know her as Fortune, and to others on whom she never smiles, by the more distant and so respectful appellative Mis-fortune, is far more frequently partial than fickle; and though her kindly offices are apt to be denied by the benefited, the want of them is no imaginary grievance if they happen to fail. It is so easy to trace Brown's failure to be but the result of his faults: so difficult to understand how Smith could be so successful without attributing it to luck, mere luck. But Jones—he *is* a puzzle; there can be no doubt as to his being a very worthy, industrious, and capable fellow, but, somehow—oh! there must be *something* wanting!

Oddly enough, it is often the strong, the clever, and the fortunate in the world who most loudly complain that its division of advantages and disadvantages should be so unjust: the weak and silly, and they who never knew prosperity, belong to its disadvantages; so no one fights for these, nor they for themselves quite so well as they might, perhaps; else would they be less weak, less silly, and not always quite so unlucky, sometimes, and run less chance of joining the ranks of the most pitiable of the poor,—starving in good clothes until they wear out, or till death, the universal relieving-officer, comes to the assistance of this class of "casual" without need for them to become applicants for *parochial* relief.

What a pretty picture Mr. Fildes exhibited last year, of a dainty pair of lovers, who, disporting on the river, have their little boat's course, down a quiet stream, checked by the rushes and water-lilies that in great assembly for consideration are asserting their natural right to share in the many charms that a bright day in summer-time brings for the river. Who can forget that grave and sagacious pug-dog on the stern-seat, from which with judicial eye he is watching in reproof those frivolous witnesses against the plaintive in the trial of life they have been called to appear in? How the "simpletons" laugh at this impediment in their way: it is of no use his rowing, and so she drops the tiller-strings, resigned to adverse circumstances!—to the unkind, perverse opposition of reeds and lilies! The sky becomes none the less clear for them, and the lark sings just as blithely for them, and the winged insects still seem to attune their murmur to the bird's song to please them; and little silvery dace, leaping to take a look at them, dip into the nature of what is about them, and jocularly making signs of wedding-rings, move the quiet, silent river to show smiles on its face again and again.

And you call these simpletons, Mr. Fildes? Was wisdom ever better exemplified than in grateful recognition of a blessed exemption from all knowledge of care; the need to labour, or to think with any more depth than may afford a fresh turn of fair compliment to the fair, and new thanks for being quite happy with everything *in situ* and *prospectu* that would tend towards a perfect felicity? No; they are not simpletons, but aviary birds, never intended to pick up a living like sparrows and pigeons and hawks and carrion-crows; never bred or reared or taught to be anything but delighted with all that is delightful: fairy denizens in whatever parish—owning them or not,—casuals of the rarest kind.

Oh, ye happy ones! it comes of consequence that ye should be very selfish to become so sleek and lovely; for

> "Sorrow breaks seasons, and reposing hours,
> Makes the night morning, and the noon-tide night."

You would be nowhere if you did not sleep well; and somewhere else if you ran no risk of indigestion.

It seemed from the first Mr. Fildes would become a very popular and delightful painter—one whose business would be to decorate pleasant facts by adding more colour to them, to please the many who yearn to derive more pleasure from what best pleases them already. But now he stands a chance of being best appreciated a hundred years hence or so, when the living body of society will be benefited by his deviation from the rule that would promise for him present prosperity more certainly; and when some miraculous remedy has come for such crying social evils as sicken the heart of the philanthropist, now in utter hopelessness of their cure. His pencil, then, will be considered as having resembled scalpel in the hand of skilful surgeon, that lays bare nerves, veins, and arteries in search of the cause of morbid appearances; that from his knowledge of what has been may come the warning of what may happen again. It will take all that time, though, before his demonstration is at all likely to effect prevention of what it treats of; though, accepting him for physician at present, as surgeon for by-and-by, he may possibly suggest some mild alterative in poor-law pathology to mitigate the sufferings of sufferers from ineradicable disorder.

Whatever betides, his picture of the "Casuals"—not the very happy ones—must ever be regarded as a great honour to the English school of painting, and a noble performance of duty; for it was nearly time, again, to show that the possession of rare artistic power brought with it some strong confirmation of grateful acknowledgment in making very good use of very great means.

NEW POLICE STATIONS IN THE CITY.

THE Corporation are at present engaged in the erection of two new police stations in the City. One of these buildings, which is considerably advanced towards completion, is being erected on a plot of ground in Snow-hill, forming a part of the Holborn Valley Improvement land, and covers an area of 5,570 superficial feet. The building, in addition to the usual offices, muster-room, instruction and recreation room, together with seven cells, has also several residential rooms for the officers, with dormitories for sixty single men. The contractors for the building are Messrs. Hill & Sons, and the estimated cost is 11,940*l*. They are expected to be ready for occupation in September next.

The other building is on a site in Tudor-street, forming a part of the Bridewell Estate, and is intended in lieu of the present station in Fleet-street. The plans have just been prepared, and the building is at once to be proceeded with. It will not be quite so large as the building in progress on Snow-hill. In addition to the general business offices it will contain four cells, together with rooms for the inspector and sergeant, with their families, and it will also contain dormitories for thirty single men. The estimated cost is 9,500*l*.

The City architect has designed both buildings.

THE CORPORATION'S METROPOLITAN AND FOREIGN CATTLE MARKETS.

A STATEMENT presented last week at a meeting of the City corporation reveals the serious and unwelcome fact that the Metropolitan Cattle Market and the Foreign Cattle Market at Deptford are both attended with an enormous annual loss. The statement as to the Foreign Cattle Market, at Deptford, is something startling, the building being pronounced a huge failure. Mr. Fricker, who gave a financial statement of the two establishments, said that the excess of expenditure over revenue on the Metropolitan Cattle Market, during the past year, had amounted to 3,437*l*.; but he added that there were 14¼ acres of land at Islington, which the committee was prepared to let on building leases, and he therefore thought that all anxiety as to the financial prospects of this market might be set at rest. His communication respecting the Deptford market was, however, of a much more gloomy character. He said that, last year, the loss was between 11,000*l*. and 12,000*l*., and that under present arrangements this ruinous condition of things was not likely to be altered. He also made the somewhat remarkable and not less alarming statement, that the only way in which the market could be made successful was by disease breaking out among foreign cattle! In continuation he explained that, as they were by charter the lords of the markets, the building of the Deptford market had been imposed upon them by the advice of the Privy Council. He stated that they were now in negotiation with the Government as to obtaining greater privileges with regard to the arrival and slaughtering of cattle at Deptford, instead of their being sent to other wharfs, or driven through the streets. If these privileges were granted to them, they might avoid a great portion of the present loss; but if not, what would the Corporation do in the matter in order to shift from themselves the loss? He undertook to say, on behalf of the Corporation, that they did not intend to submit to a loss of 10,000*l*. or 12,000*l*. a year.

A discussion of a somewhat unusual and remarkable character in reference to the building of the market followed the above statement. Mr. Bedford remarked that they took the matter in hand with all the responsibilities attached to it. They built the market, knowing that in all probability it would be a financial failure. They were told by the Government that it was to be a market to meet special emergencies when they occurred, and they came to this particular fact as to this market. It ought to be a great source of satisfaction to them that it was a failure, and its success a matter of the deepest regret. If they knew when they spent the money that financially the market would be a failure, it was one of the grandest things they had ever embarked in! Mr. Rudkin said that from the very commencement he protested against the construction of the Foreign Cattle Market. Now what was to be done with the market in future? The committee were doing the best they could to get some concession from the Government. If that were not made it seemed to him that they might appeal to Parliament to do what was right. The Corporation should not suffer a loss of 12,000*l*. a year on the market for the public good. Several suggestions were made in the course of the discussion, which was continued for some time, Mr. W. S. Gover stating that a special financial committee should be appointed to lay down a policy to decrease the annual loss by some means. There was the practical suggestion of raising the tolls and utilising the lands, but something should be done. Ultimately the report and statement were simply received, and further action deferred to a future meeting.

THE LATE SIR EDWIN LANDSEER'S MANSION AT ST. JOHN'S WOOD.

FOLLOWING upon the sale of the late Sir Edwin Landseer's pictures, the residence of the distinguished artist, in St. John's-wood-road, was sold by auction at the Mart, Tokenhouse-yard, on Wednesday, together with the grounds, which cover an area of two acres. Amongst the company present there were several leading artists, as well as land agents, surveyors, and others interested in buildings and property.

The mansion is situated in St. John's-wood-road, on the south side, between Grove-road and Cunningham-place, having a frontage to St. John's-wood-road of 232 ft., the grounds extending in depth northwards to the extent of 500 ft., and bounded on the north side by the towing-path of the Regent's Canal. The house is in the Italian style of architecture, principally two stories in height, and was specially reconstructed and enlarged by the deceased artist with the view of adapting it to his requirements. The first floor contains a studio, 26 ft. 6 in. by 17 ft., and 12 ft. 6 in. high, well lighted by large windows. On the ground-floor is the painting saloon, or studio, 40 ft. by 24 ft., and 15 ft. 6 in. high, opening on to the terrace and gardens, with asphalte floor, with an ante-room adjoining, 12 ft. 6 in. by 8 ft. 6 in., and 15 ft. 6 in. high; also a sketch-room, 17 ft. 6 in. by 10 ft. 9 in., and 15 ft. 6 in. high. The outbuildings include carriage-house and stables, enriched externally by friezes from the Elgin marbles. It was stated that the site on which the house and outbuildings stand, together with about an acre of the grounds, is freehold, and the remaining portion of the grounds leasehold for a long term, rent free.

The auctioneer, in submitting the property, suggested that the three frontages to St. John's Wood-road, Cunningham-place, and Grove-road respectively, rendered it a valuable site for the erection of good houses, should the purchaser be so disposed to appropriate it. The first offer made was 3,000*l*., the property, by a very spirited competition, being rapidly run up to 5,800*l*.

Whilst it stood at this sum the auctioneer stated that as it was now out of his hands it must be sold if there was no further advance. 6,000*l.* were, however, quickly offered, followed by higher bids in rapid succession of 100*l.* each, and at length the hammer fell at 6,850*l.*, for which sum the property was purchased.

THE PROPOSED WORK IN ST. PAUL'S.

THE statement, as to this matter, which has appeared in some of the papers, and has dismayed many admirers of Wren's masterpiece and London's pride, goes a little farther, we are glad to say, than the truth. The resolution really passed, proposed by the Dean of St. Paul's, and seconded by Mr. J. B. Beresford Hope, is as follows:—

"The Executive Committee having considered the resolution of the Fine Arts Committee (which was adverse to Mr. Burges's plans), decides to accept *as a basis* Mr. Burges's design for the completion of the apse and choir, but reserves its approval of it for further consideration."

This, which was carried by nine to four, still admits of escape. We will not believe even yet that the Committee seriously contemplate cutting away the face of the masonry and substituting a lining of marble. Should they commence to do so, a public meeting should be called to protest against it, and the aid of Parliament invoked to prevent such an injurious, unwise, and indefensible act.

Amongst the proposals for the internal re-arrangement of St. Paul's, apart from its ornamentation, is one by Mr. Jas. Fergusson, to which, however, we do not allude further in case it may not yet have been formally discussed by the committee.

ART UNION OF LONDON.

The following are the principal works already selected by prizeholders:—

From the Royal Academy.—"Oh! Hush Thee, my Babie," C. W. Cope, R.A., 200*l.*; "Checkmate," J. A. Vinter, 150*l.*; "Angers, Maine-et-Loire," G. C. Stanfield, 100*l.*; "A Rustic Genius," J. C. Waite, 100*l.*; "Loch Fyne, from Tarbert, Argyleshire," D. Cameron, 85*l.*; "Hastings Fishermen Beaching their Boats in a Storm," S. S. Tuckerman, 75*l.*; "The Ferry Market, Morning," A. de Bylandt, 45*l.*; "The Visitors," T. Earl, 42*l.*; "A Berkshire Lane," A. de Bréanski, 35*l.*; "Colwick Grove," A. W. Cox, 35*l.*; "Mussel Gathering on the Beach, near Monkstone, South Wales," G. A. Williams, 35*l.*; "Caldron Linn, Perthshire," J. B. Smith, 30*l.*; "A Quiet Stream," R. H. Wood, 30*l.*; "The Castled Crag of Drachenfels," J. L. Vychan, 25*l.*; "On the North Devon Coast," W. H. Borrow, 20*l.*; "At Hastings," J. M. Barber, 20*l.*

From the Society of British Artists.—"Styhead Pass, Cumberland," Mr. S. R. Percy, 100*l.*; "Puzzled," Charles Stuart, 75*l.*; "The Old Boathouse in the Backwater," W. Gosling, 70*l.*; "Retired Leisure, &c.," R. Redgrave, 57*l.* 15*s.*; "Down the Sultry Arc of Day, &c.," A. Panton, 50*l.*; "Threading Granny's Needle," Wells Smith, 50*l.*; "Hoar Frost," G. A. Williams, 50*l.*; "Bass Rock," E. Hayes, 45*l.*; "His first 'Knickers,'" Wells Smith, 45*l.*; "French Peasantry," F. G. Kinnaird, 40*l.*; "Lighting the Beacon," W. S. P. Henderson, 40*l.*; "In the Valley of Llangollen," J. Godet, 30*l.*; "Windermere, Evening," C. Smith, 30*l.*; "The Keeper's Home," E. R. Breach," 30*l.*; "The Duellist," W. H. Haines, 25*l.*; "A Beggar," J. T. Peele, 25*l.*; "Spring Time," A. M. Phillips, 25*l.*; "View near Guildford," J. Thors, 20*l.*

From the Crystal Palace Gallery.—"River Derwent, near Matlock," A. de Bréanski, 30*l.*

From the Society of Painters in Water-colours.—"The Last Home of the M'Nabs," Paul J. Naftel, 60*l.*

From the General Exhibition of Water-colour Drawings.—"Ponte Vecchio, Florence," Chas. R. Aston, 20*l.*

RE-OPENING OF THE CHURCH OF ST. NICHOLAS COLE ABBEY, QUEEN VICTORIA-STREET.

THE Church of St. Nicholas Cole Abbey, and St. Nicholas Olave, which, according to a tablet on one of the walls, was the first church built by Sir Christopher Wren, after the Great Fire in 1666, has for some time past been closed whilst undergoing extensive alterations and repairs; and these having been completed, the church was re-opened last week. The works of the Metropolitan District Railway had affected the south side of the church, and the rubble masonry having settled, this portion of the structure has been reinstated and refaced. The other external works include a new entrance on the south side from Queen Victoria-street, which is approached by a wide flight of stone steps with iron gates. This doorway, which formerly opened into a yard, is now the principal entrance. A stone wall, with an open balustrade, has also been erected in front of this side of the church, which separates the edifice from Queen Victoria-street. The old plain windows have also been removed, and in their place windows of a more modern character have been inserted. The internal alterations include the removal of the old pews, and the substitution of open benches. The alterations have cost 4,000*l.*, and towards this sum the Metropolitan District Railway contributed the sum of 1,681*l.* as compensation for the injury which was done to the church during the construction of the railway. The designs for the alterations were furnished by Mr. W. Hudson, architect; and Messrs. Hill & Sons were the contractors.

THE VALUE OF OUR FIRE PREVENTION ARRANGEMENTS.

A FIRE broke out, the other morning, in one of two adjoining houses in Chandos-street, occupied by Messrs. Benham & Froude. The fire-engine station is nearly next door to these houses, and, according to all accounts, there was a plentiful supply of water. Nevertheless, the fire was not subdued until the two houses had been completely gutted (not an inch of anything that would burn being left unburnt), and some neighbouring premises damaged. Such an incident is very suggestive, and, as it seems to us, very damaging to existing arrangements.

MONUMENT TO THE LATE DR. SALE, VICAR OF SHEFFIELD.

THE monument over the grave of the Rev. Dr. Sale, in the General Cemetery, Sheffield, has been erected by Messrs. Poole & Sons, of London. The monument is not very large. It stands on a bed of grey granite, and the base is approached by three granite steps. The base itself is of red Mansfield stone. The monument, which is of Bolsover stone, is Gothic in form. The corners are of polished granite, and the capitals bear the figures of four angels. They are emblematical in their character. One bears the sword of the spirit, the second carries the helmet of salvation, the third the breastplate of righteousness, and the fourth the shield of faith. The top is surmounted by a cross of large dimensions. The design of the cross is somewhat peculiar. On two sides of the monument there are panels of polished granite. One of them bears the inscription. Above the inscription there is some figure-carving. The monument was designed by Mr. A. Blomfield, of London.

METROPOLITAN SCHOOL BOARD.

THE works committee having invited tenders for the erection of a school to provide accommodation for 1,003 children in Gloucester-road, Camberwell, the following were the respective amounts:—

Ennor	£11,569	0	0
Patman & Fotheringham	11,568	0	0
Manley & Rogers	11,227	0	0
Staines & Son	11,186	0	0
Grover	10,975	0	0
Dove, Brothers	10,970	0	0
Perry, Brothers	10,816	0	0
L. H. & R. Roberts	10,729	0	0
Browne & Robinson	10,598	0	0
Sewell & Son	10,469	0	0
Scrivener & White	10,434	0	0
Jerrard	10,246	0	0
Hill, Higgs, & Hill	10,240	0	0

As the above tenders were all considerably higher than the committee had expected, the architect was instructed to replan the school, in order, if possible, to reduce the cost. This has now been done, and the architect's estimate for carrying out the revised plans is 9,800*l.*; but in order to effect this reduction of 440*l.*, several of the best features of the planning must be left out. The committee therefore resolved to recommend the acceptance of the lowest tender, that of Messrs. Hill, Higgs, & Hill, of Crown Works, South Lambeth-road, amounting to 10,240*l.*, for carrying out the erection of the school according to the original designs. It should be mentioned that the site contains an area of 32,775 square feet, and that consequently the cost of the boundary-walls and tar-paving is considerable, the former item amounting to 540*l.*, and the latter to 395*l.* The estimated cost of the covered ways, also, is 625*l.* It will thus be seen that the amount of the tender, less these three items, would be 8,680*l.*, being at the rate of 8*l.* 13*s.* per head. Cost of site, 2,621*l.* 14*s.*

On the 20th of November, 1872, the Board agreed to purchase a site in Rolls-road, Southwark, containing an area of about 18,095 square feet, for the sum of 1,600*l.* and costs. In carrying out the necessary excavations for the school, it has been discovered that the site is a peat bog, and the greatest care has been found necessary to secure a sound foundation for the building. The walls and floors will have to be carried, not upon sleeper walls, as usual, but upon iron girders, and the excavations made to a depth of 13 ft. The extra expense which will thus be incurred amounts to 2,034*l.* 6*s.* 4*d.*, and the committee have asked the authority of the Board for this expenditure, which is absolutely necessary to render the structure safe.

On a proposal by Mr. Currie to raise the salaries of the architect's department, specially for this year, as there had been a great pressure of work for many months, and they had frequently been working double time;

Lord Napier said some of the salaries were so small as to be little more than the wages of mechanics.

The proposal was agreed to for one year.

BLEWBURY CHURCH, BERKSHIRE.

THE church of this parish, which is to be restored, includes several interesting features; for instance, the Norman chancel retains its original vaulting, additions have been made to the first design in subsequent periods, but little alteration of the main fabric has taken place. The lower stage of the centre tower (for the church was cruciform) still forms part of the present building, although a tower at the west end was erected in the fifteenth century.

The present state of the building is about as deplorable as it well can be. It is pewed and galleried to the ceiling, and the structural parts of the fabric are in much need of repair. It is not intended to interfere with any of the distinctive features of the church, only so far as is necessary to preserve it for posterity. Mr. E. Dolby, of Abingdon, is now preparing the necessary drawings for the proposed works.

EDINBURGH.

AT this season Edinburgh is annually visited by the east wind and the clergy; black coats and cold blasts meet one at every turn; the newspapers abound in advertisements of presentations of pulpit gowns to favourite pastors, and hints are thrown out that those who have a "prophet's chamber" will learn of an occupant by applying at the offices of the church.

The United Presbyterian Synod is now in full swing, the Congress of the Episcopal Church of Scotland, and the Assemblies of the Established and Free Church are open. During the sitting of the Episcopal Congress, the foundation stone of St. Mary's Cathedral was laid. The foundations are now up to the street level, with the exception of the north-east pier of the central tower, where the stone is to be laid. The contract, which does not include the spires at the west end nor the chapter-house, has been taken by Mr. G. W. Booth, of London, at 87,830*l.*, and the works are to be carried out under the superintendence of Mr. Morgan.

Mr. David Bryce has completed his designs for the new head office for the Union Bank of Scotland, to be erected in George-street, and the plans are now under the consideration of the directors. At the Royal Infirmary we observe that the central portion of the old building on the ground is being erased in order to proceed with the construction of the administrative department; the wings are to be retained as they are in excellent condition, having been only erected a few years ago, and slight alterations within will make them suitable to the requisite purpose, and an overhaul without will give to them the style of the rest of the buildings.

The Edinburgh School Board having called for plans for two schools to be erected in different localities, to the west and east of the city, as a test, have selected the designs of Messrs. Anderson, Moffat, Beattie, and Wilson respectively, as most suitable, and each of these gentlemen is, we understand, to have a share of future work.

Mr. Robert Moreham has prepared plans for a new church in connexion with the parish of South Leith, which is to be erected at Norton-place, at a cost of about 6,000*l.* This sum does not include the construction of a spire, for which provision has been made.

Messrs. Taylor & Sons, the contractors for the carved woodwork of the Royal pew, &c., at St. Giles's, have raised an action against the Restoration Committee for the sum of 807*l.* 4*s.* 1*d.*

as the balance of their contract. As we have already stated, the committee allege they were led into incurring extra expense by the requirements of the Government authorities; wherever the responsibility lies, it would be a most ungracious act to cause the committee to bear the whole burden. It is not a very heavy one, after all, and we trust the matter will be adjusted in a satisfactory manner.

Mr. Stephen Mitchell, tobacco manufacturer, Glasgow, has bequeathed to the corporation of that city a sum of 70,000*l.*, to be applied in founding a public library; failing acceptance by the Glasgow authorities, it is to be offered to those of Edinburgh; and if not accepted by either for the purpose indicated, the money is to be applied for bursaries equally between the Universities of each city.

The good people of Glasgow are not likely to let this plum slip through their fingers.

A TRIBUTE TO DAVID LIVINGSTONE.

SIR,—I find that the Scotch have determined to erect a monument in the capital of the native country of David Livingstone, to his memory, viz., in Edinburgh. Allow me to suggest that Scotland be not permitted to stand alone in this respect, but that England also should raise a statue to commemorate the deeds of one of the greatest, if not the greatest, explorer and traveller that has ever been known in the world. His undaunted courage also, coupled with his acts of daring, ought to be remembered by all. I simply write these few lines to express my own ideas on this point, but am fully convinced that there are many others who will share them with me. I think a subscription might be started in England towards this object. The site which appears to me to be the most suitable for placing the Livingstone Memorial is the open space in Waterloo-place, on the side nearest St. James's Park.

A EUROPEAN TRAVELLER.

ENLARGEMENT OF ST. PETER'S CHURCH, BRIGHTON.

A PUBLIC vestry meeting of the inhabitants of the parish of Brighton has been held in the Town Hall, to receive a report from the architect and churchwardens as to the present condition of St. Peter's Church and contemplated alterations and improvements therein.

Mr. Somers Clarke read the report, which first treated of the present state of this early specimen of Sir Charles Barry's Gothic edifices; which is quite sound in its fabric, except where pinnacles and carvings have suffered by the perishing of the stone during the time which has passed since its erection in 1823. This was one of the earliest modern churches of importance built in the Gothic style, then being revived in this country. From its extreme shortness, the proposed enlargement will chiefly consist in the lengthening of it in its leading lines, but the accommodation will be so far diminished by the removal of a gallery. The report in explaining the proposed scheme, said :—

"It is proposed to remove the large gallery at the south end of the church and the organ over it, and throw the whole of the space underneath (the greater part of which is now wasted in useless lobbies) into the church, providing an independent staircase for each of the side galleries, which are not proposed to be taken down, but only to be reseated. To remove the north end of the church, and to rebuild it with its three fine windows as the termination to the proposed chancel.

To compensate for the removal of the south gallery by adding one bay to the length of the nave, making it six bays long instead of five, as at present, and to build a spacious chancel with the aisle continued on either side; that on the east being appropriated for the vestry and organ.

The architectural proportions of the church lend themselves very readily to such an enlargement; indeed, the nave could easily be made even one bay longer than I have suggested, and the church would not then be at all in excess of many of our old parish churches in large towns." These and other alterations are estimated to cost from 15,000*l.* to 20,000*l.*

The meeting unanimously resolved :—

"That St. Peter's Church, being now the parish church of Brighton, it is necessary that it should be altered and enlarged so as to fit it for the parish church of this large and populous town in the centre of the county, in accordance with the report and plans now submitted to the vestry, the same being carried out by voluntary contributions."

A building committee was also appointed to obtain funds by voluntary contribution, and carry out the purpose of the meeting.

The vicar and the church fund together will contribute 1,000*l.*, and Mr. Somers Clarke, 100*l.*

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT an ordinary general meeting of the members held on Monday evening, the 18th inst., Mr. Henry Currey, vice-president, in the chair, the following gentlemen were elected associates:— Mr. Cole A. Adams, Mr. Thomas Browne, and Mr. W. Galsworthy Davie.

The Secretary (Mr. Charles L. Eastlake) announced that the sum of 113*l.* had been expended in the purchase of books for the library, the list of which was laid upon the table.

Mr. T. Roger Smith then read a paper on "Town and Country Schools."

In the discussion which followed, Mr. I'Anson said, in proposing a vote of thanks to the reader of the paper, which was full of information, that as the school which was being built for the Merchant Tailors' Company had been alluded to, he ventured to add a few words in reference to it. It was a school where it was intended that a liberal education should be given to the middle classes. As a remarkable feature in the arrangement of the school, almost all the teaching would be conducted in class-rooms. There would also be in connexion with this school one large lecture-room, capable of holding half the total number of scholars attending the school; and in addition to this, there was one large room which, on special days, would be used for the general assemblage of the whole of the scholars. He believed that it was intended to meet there once a day in this large, and what he hoped, would be a very noble hall. Then this school was intended entirely as a day-school for children residing in the neighbourhood; and once admitted in the morning, they would not be allowed to depart during the day, so that it had been necessary to provide suitable accommodation for dining. This he believed had been kept quite apart from the school building. As many of those present were, doubtless, aware, the building was being erected on the site of the old Charter-house; and he hoped that it would in a great measure enjoy the prestige of the Charter-house. The heating apparatus would be conducted upon one systematic plan—the plan which had been adopted with considerable success at the Albert Hall. The air would be forced into the building by a fan working at a great velocity over tubes throughout the building, and it would be heated by air passing over pipes, heated by low-pressure steam.

Mr. Robins, in seconding the vote of thanks, said he was glad to see that Mr. Roger Smith recognised in his paper that the fundamental function of a school was for teaching purposes; and he (the speaker) rejoiced to find that the London School Board had taken that view. If any one endeavoured to subserve two or three different purposes, it would sure to be to his detriment. Speaking of the arrangements of different schools, he thought that the older children required to be put into smaller class-rooms than the younger ones; and he knew that this was the case in the North London Collegiate Schools. For middle-class girls, the rule was that in the lower grades they had 50 children pupils each; and in the classes where there were no upper grades, they had only 30 pupils each. It was also desirable to have a withdrawing-room for about 20 out of that number. As regarded the right quantity of space to be provided for every child in a class-room, it was about 10 square feet.

Mr. T. Chatfeild Clarke was of opinion that the difficulty under which the School Board laboured had been not only difficulty of classification, but difficulty of money. Of course it had been felt by those who were interested in this work of education that it was the duty of the Board to provide the best possible available buildings in which to carry on the work of education; but at the same time they felt bound to study the ratepayers, and therefore could not go so fully into class education as many had desired. It was felt by many of those who had taken a deep interest in this question that the school in Jonson-street, Stepney, which had been erected from the designs of Mr. Roger Smith, was the best elementary school they had seen. He (the speaker) was one of those who had urged from the beginning that the London School Board should take upon itself this satisfactory system of classification. He had always considered that the best education they might give was the cheapest. He had seen the primary schools at Edinburgh, which were worked upon the very same system as that employed in Jonson-street. In one of their largest schools, where there was no hall, they taught 1,200 children in common classes of 54. In conclusion, he strongly maintained the necessity for instruction in separate class-rooms, and his experience of the London School Board more and more confirmed that view.

ON TOWN AND COUNTRY SCHOOLS.*

THE infant schools of the present differ but little from those of past years; but when we come to schools for boys or girls above the age of infants (now often called "graded" schools, because the children are separable into six "grades," or degrees of proficiency), we find, if we inquire into what has been done since the passing of the Education Act, that considerable variations have been introduced. In Leeds, I am informed that schoolrooms of great width, approaching an old Lancasterian school, have been erected, thus of course preparing for more or less of a return to the simultaneous system of teaching, or at least relying upon the master's power of influencing large numbers. Details of arrangement in these schools are not, however, in my possession, and it will be better to proceed at once to some of the work of the London School Board, and the variations introduced in these schools. Their general principle has been to isolate a larger number of classes than before, but not to render it impossible to bring together all the classes of one graded school into a general room. The usual arrangement of one department of one of their graded schools may be said to be that a schoolroom and two class-rooms are furnished,—often one class has a class-room to itself, two others being taught in a large class-room divisible by a sliding partition into two halves, so that when separate teaching is going on there may be a tolerable separation of one class from the other. In many instances, however, both the class-rooms are so subdivided. The remaining pupils, forming one half of the number in the department, are then taught in the schoolroom, and when a lesson is to be given to the whole department the children are brought in from the class-rooms and crowded together into the schoolroom.

We are thus landed exactly half-way on the road towards the system of a separate class-room for each class, and for the time being it is thought we have gone far enough. Perhaps the experience of a few years may show that another step in the same direction is not so impossible as it is now believed to be.

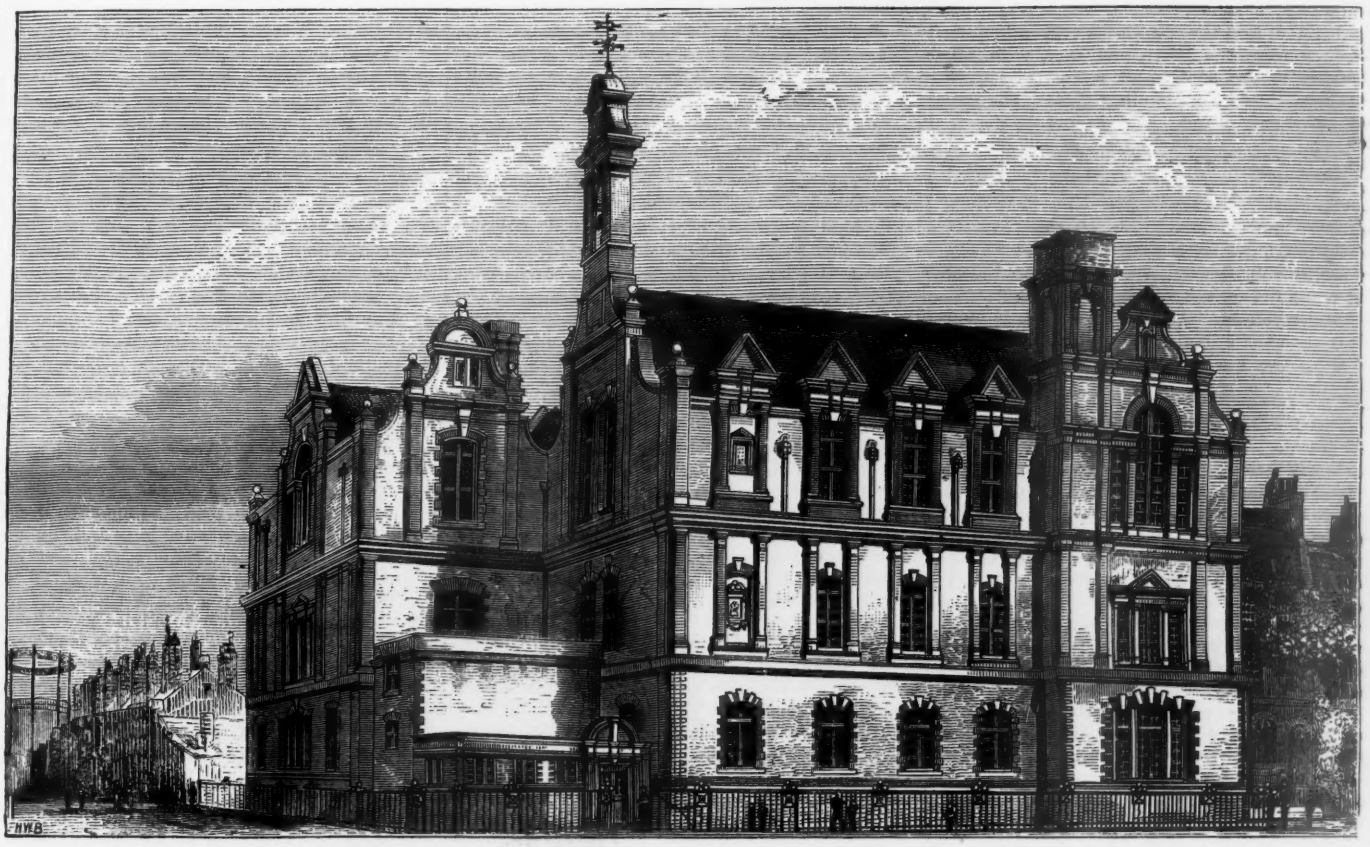
The increased separation of the classes is not, however, the only modification introduced into the old scheme. If you visited any good school not under Government inspection—and, indeed, in many that are so inspected the same arrangement occurs—you found desks and seats placed four deep, and even five deep, instead of three deep, and ten to one the teachers tell you they would sooner have the children massed in front of them, so as to be well under the eye, than spread out to right and left, till they cannot be all taken in by the eye at one moment. It was early decided to provide for teaching in the London Elementary Schools a greater number of rows of children than three, and school-rooms were accordingly built 22 ft. wide, or from that to 20 ft., the class-rooms being 20 ft. to 18 ft. wide.

Confusion, crowding, and inconvenience were to be detected in a school with benches as much as 12 ft. in length, and sometimes occupied by as many as eight children in a row, if you watched the working of a class even only three deep, where (as in a writing or a ciphering lesson) the teacher required to go near to each individual child, especially if it be a child in the middle of the middle bench. Much more serious did this become when the class was arranged four deep or five deep. This difficulty is, of course, not felt in Swedish and other schools where each child has a separate seat and separate desk. But there loss of room is occasioned thereby, and the fittings become expensive. Eventually, therefore, it was decided to seat the schools with short benches and desks, each long enough to hold two scholars. By leaving a narrow gangway between each line of desks the master can go to any boy or call any boy out without disturbing the class. The whole class

* From a paper by Mr. T. Roger Smith, already referred to.

KÖNIG WILHELM GYMNASIUM, BERLIN.

[See p.451, *ante*.



WEST STREET SCHOOL, LONDON FIELDS.

[See p. 452, *ante*.

can also leave or enter their desks at one time with great ease. A very judicious economy of space, combined with great improvement in comfort, has also been effected by curtailing the width from front to back allotted to a desk and bench by the old rules of the Committee of Council, causing the edge of the desk to be vertically over the front edge of the bench when pupils are seated, and providing the desks each with a flap to turn up when they are to stand. Every portion of this contrivance will be found to have received careful attention, the result being, I think, a fitting not likely to be much improved. In these desks, then, the distance from back to front is from 23½ in. to 26½ in., the mean being 25 in., so that five rows of children will average 10 ft. 5 in. The desk and bench for two pupils are 40 in. long, and the intervening gangways are 16 in. wide. The floor-space to be allotted to each child is not less than 9 ft. in the graded schools and 8 ft. in infant schools; 13 ft. clear for graded schools and something more for infant schools may be taken as a proper height.

The desks and benches being designed, and the space they will occupy settled, the next question which presents itself is, how are they to be lighted? This is a question of more importance, and I may add more complication, than has been often believed. The Germans, whose thoroughness is proverbial, design each room with exclusive reference to the light that is to fall on the desks, and modify the design of the whole building, if necessary, to a large extent, so as to secure the aspect they require for the windows. In a German school the light *always* falls from the side of the pupils, and *always* from their left hand as they sit to write; and it falls from nowhere else. No cross lights are allowed, and if there is a difficulty in reconciling a convenient arrangement of seats with lighting from the left, then the convenient arrangement of seats must give way in order not to infringe this cardinal rule. The reason why lighting from the left is good will be obvious when you reflect that in writing and ciphering this is the only side-light which prevents the shadow of the hand from interfering with the work. The advantage of side-light over light from behind the children is, that the teacher is not dazzled, and the children's faces are not lost to the teacher, and the children do not sit in their own light. The advantage side-light possesses over light from behind the teacher is, that the children are not dazzled, and, as I already have observed with regard to infant schools, that their teacher and his diagrams and maps are easily seen by it.

The rule of lighting from the left cannot practically be carried out except when the teaching is in class-rooms; for if in a schoolroom where several classes are taught you attempted to place the children with their seats at right angles to the wall, you would be landed in a series of inconveniences so grave that they could not be tolerated. Nor can the rule of lighting only from one side be easily made consistent

with that passion for through ventilation by means of a direct current of wind from window to window, which has so strong a hold upon those experienced in school management, as well as hospital management, in England. Accordingly the practice with regard to schoolrooms has been at the best a compromise. As much side-light as is obtainable has been, in some of the recent London schools, procured from the ends of the general schoolroom, but for the majority of the classes there taught windows both back and front are commonly supplied.

The position of windows should be high, their tops as near the level of the ceiling as possible, and their cills at least 4 ft. from the floor. If higher, so much the better. The dimensions of the windows, if centrally placed in the room, should suffice to furnish one superficial foot of opening to every 80 cubic feet within the room. A less proportion of glass suffices for a skylight.

The aspect of school and class rooms has been much discussed. If on a town site there is an aspect where quiet can be better secured than elsewhere, or where a greater volume of light is obtainable, that aspect it will, generally speaking, be wise to occupy with windows; but if there be free choice, it is right to secure the best light,—namely, the northern and eastern light for work, and the sunny or southerly aspect for warmth and cheerfulness. It is not healthy for the sun never to reach a room; it is not comfortable for the glare of such summer sunshine as we occasionally enjoy to stream in at all the windows of a school or class room. The principal light for the pupils is therefore best obtained from the north and east, with other windows to the south and west. The glazing should always be with clear glass; the panes not extremely large. The greater portion, if not the whole, of every window should open, and if any part be fixed it should be the lower part. The worst mode of opening school windows is the ordinary sash, as it lets in a direct draught, and the common casement is open to pretty much the same objection. The best mode by far, is the casement hinged at the bottom, and made to fall inward at the top, often called hospital windows. This will give a large amount of air with the minimum of draught, as the air entering the room is directed upwards. The casements of one window can be connected together by an iron rod, and all shut and opened simultaneously with ease. Cords and pulleys are not desirable for use in schools. In very bad neighbourhoods a protection of wire netting is sometimes added outside the window, to prevent injury from stone-throwing. It should not be adopted when it can be avoided. In contriving windows a place where a blind can hang should not be forgotten. In planning them the light should be pretty evenly distributed over the school or class room; and both on this account, and to give more perfect control over ventilation, several windows of moderate size are generally preferable to one large one.

The actual size of the majority of the schools, embracing all three departments, recently built by the School Board for London, has been usually either for 1,040 children or 780. In the former case the numbers are 400 infants, 320 boys, and 320 girls; in the latter, 300 infants, 240 boys, and 240 girls. The buildings have commonly been three stories in height, the infants having the ground floor, and the boys and girls each one of the upper stories. But very frequently a part of the ground floor has been devoted to those most desirable adjuncts, covered playgrounds. Indeed, in many cases, the infant-school is a separate building, and the graded schools are two stories in height,—one for boys and one for girls, with covered playgrounds under the whole space they occupy. These play-grounds cannot be too sunny. They should not be draughty if it can be prevented. There is some difficulty in apportioning the numbers in theory, into the classes corresponding to the six grades of the Education Department, owing to the fact that the number of children in the higher grades is always smaller than the lower ones; but in this, as in other things, theory always differs from practice, and with 240 children six classes of forty would be prepared for—half the number to be taught in class-rooms, half in school-rooms. Originally the class-rooms were required to open out of the school-rooms, the doors having glass in them; and when there were double class-rooms with a sliding partition to connect them together, it was desired that both halves of the double class-room should open out of the school-room. It is to be observed, however, that in recent schools, such as some of those figured in Mr. Robson's book, the class-rooms have an independent communication with the staircase, and indeed in the school which he selects as a model they do not open out of the school-room at all, a significant advance in the direction of more complete isolation.

The best position for the class-rooms is across the two ends of the school-room, leaving the wall facing the children in the school-room free for cross ventilation; and if it be not considered essential for them to open out of the school-room direct, there will usually be no difficulty in so placing them as to permit side-lighting for a portion of the classes in the school-room itself. Even, however, where this has been possible, it has been taken as a fundamental principle to start by placing the school-room so that the windows at the backs of the classes shall admit north light.

There ought to be no corridors. As in older plans, the whole of the openings and breaks for doors and fireplaces in the school-room should be in one wall, so as to have the opposite wall free from end to end for seats; but the old L-shape and T-shape are not to be found in the school-rooms of these recent schools, but a shorter and wider room, of plain rectangular plan, takes their place.

It is desirable, where the schools are large, that there should be two staircases to each department. The place for the staircase is at the angle between class-room and school-room; and in a school of the most perfect arrangement, such, for example, as the one at Angler's Gardens, figured as "a model arrangement for a school of the kind," in Mr. Robson's book the points attained are tabulated by him as follows:—

1. No space wasted in corridors.
2. Double exits, so that one part can be cleared without disturbance to the remainder.
3. The same number of class-rooms as classes in the school-room.
4. Side lighting in every case.
5. Class-rooms arranged in pairs, for working by a certified master and pupil-teacher in each case.

Class-rooms arranged in pairs imply some means of throwing them together and separating them at pleasure. Movable partitions of various sorts have been tried for this purpose, sometimes sliding up like sash-windows, sometimes running forward on rollers upon grooves in the floor, sometimes hung at the top. Mr. Stones has patented a sliding partition, which seems as fairly successful as any; but my own impression is that none of them answer well, or ever will answer. Where they must be employed the best arrangement is to have two parallel to one another, with a space between. Even this will not keep out sound. I believe it will be impossible altogether to prevent injuries to children arising from their use, and I cordially echo the observations in Mr. Robson's book, "That there is no known movable partition which is at once simple, easily moved by a child, and perfectly sound-proof. Whether for this reason, or because of the additional expense, movable partitions should never be adopted, unless the working of the school should render them absolutely necessary"; and further on, "The fewer specimens in use in any school, the better will probably be the condition of the school."

In the Orange-street and Mansfield-place schools, for example, pairs of class-rooms will, it is true, be found; but the separation between them is by a wall, with a door of communication, to enable the teacher to pass from one to the other, as occasion requires, and this arrangement seems, on the whole, an advance upon the sliding partition arrangement. It is fair, however to observe, that in the famous American schools sliding partitions are constantly made use of, and that to such an extent as to permit several adjacent rooms to be thrown together.

We now come to the staircases. They require to be so placed that boys and girls can go separately to their different departments of the schools, and can enter at distinct entrances; but in many places these objects can be well accomplished without two distinct staircases, by the use of one of those arrangements where stairs starting from two distinct points follow each other between the same four walls. Staircases to be used by children should have no winders (though I do not think all the Board Schools have adhered to this rule), they should not have more than 6 in. rise. It is not found necessary to make them wider than from 3 ft. 6 in. to 4 ft., though sometimes wider stairs with a handrail fixed up the centre of each flight, as well as up the sides, are found to answer well. The flights should be short—the landings wide, and if possible there should be no open well-hole. The best sort of staircases for a school is the one where a wall takes the place of a well-hole, and with the aid of this central wall two staircases can be obtained perfectly separate from each other in two different ways, the flights can either cross one another or follow one another.

A staircase once almost universally used in schools is one where three short flights run round three of the sides of a square tower, with a landing on the fourth. It is now very much abandoned, and I think wisely, for it has led to fatal accidents, owing to its open well-hole; and at the Cowper-street Middle-Class Schools, where such staircases are in use, they are caged in with iron-like prison bars—an arrangement which even in lunatic asylums is now disused if possible.

The reason just given for avoiding an open well-hole is one which ought never to be absent from a school architect's mind. Children will injure themselves if they possibly can, and will from pure heedlessness or from mischief injure anything else they can get at. Everything, therefore, which might do them harm, or to which they might do harm, must if possible be dispensed with.

The other adjuncts within the building ought to be a lavatory, and a cloak-room for each department. These need not be high, and as the height of school-rooms is considerable, a mezzanine cloak-room may often be introduced with advantage. It is desirable for the cloak-room to have two doors, and a sufficient number of strong wrought-iron pegs. The lavatory should have, it is considered, two to three basins to each hundred children, each basin to have a separate cock. Outside the building the children's conveniences should be placed; these ought to be arranged in a straight line, and are best furnished with a trough of slate or iron, or a pipe of drain tile in which water stands constantly, and from which it can be drawn off with a rush two or three times a day. The number of latrines should be, according to Mr. Robson, three for the first hundred, and one in addition for every succeeding fifty: this is certainly the minimum number. Of course, they are to be perfectly distinct for boys, girls, and infants; and separate accommodation is to be provided for teachers and for care-takers.

We have named covered playgrounds as procurable in many cases below the school-buildings. Where this is not done, a play-shed open towards the south should be provided for each department, or at least two, one for boys and the other for girls and infants, are required. Drawings of playground fittings are so seldom required that I need hardly detain you about them, but it is often the architect's duty to advise as to how to cover a playground. The question is not easy. The London School Board have decided it in favour of tar pavement, which is cheap, and answers fairly well, if well done; but it is not so durable as the better sorts of asphalte.

A teacher's room is a necessary appendage to each department, and a set of rooms for the care-takers who reside on the premises, is usually provided in a convenient part of the school block.

It remains to consider for a moment the heating and ventilating of these schools. The lighting having been already disposed of, as it is a primary consideration in determining the disposition of the building.

For schools of moderate size, that is to say up to 500 children in all, the London School Board have preferred open fires. For their larger buildings they have adopted systems of heating from a central apparatus. The original cost of an apparatus is of course considerably greater than that of open fireplaces, even including stove-grates and the brickwork of chimneys and chimney-breasts, but it is a far more scientific mode of heating, and more economical of fuel; and as experience is gained in the construction of such apparatus, it is not impossible that they may be extended to smaller schools.

Of the stove-grates capable of being employed in schools where open fires are used, Mr. Robson enumerates those known as the Galton, Manchester, Boyd, Pearce, and Longdon grates. Of these I am more familiar with the one invented by that very ingenious engineer, Mr. Boyd, than with the others, and it appears most admirably contrived to obtain the largest amount of heat possible from the fuel consumed, and to throw a large quantity of warmed fresh air into the room.

In two schools which I have erected for the

London School Board, a warm-air apparatus has been adopted upon my advice. In the larger of the two, that at Stepney, a most careful investigation was made of the proposals submitted by six engineers, and it resulted in the adoption of those of Messrs. Price & Co. Fresh air is admitted to a chamber on the basement, where it is warmed by passing between flat vessels in which hot water is circulating at low pressure. The air so heated is conducted along flues carefully built for the purpose to every room in the building, and discharged through inlets near the floor. A class-room, 20 ft. by 27 ft., and 13 ft. high, has for example two of these inlets, and practically a current of sweet and warm air is constantly pouring into the room through each of them. Near the ceiling of each room is an opening leading to an extracting flue. All the extracting flues are led into air trunks running along the roofs, and meeting in a central chamber, where a nest of vessels similar to those employed to warm the air is fixed. This acts as a rarifier to stimulate the outgoing current, and a steady stream of air is found in actual practice to be constantly flowing out of each room along these extracting channels.

The other school was warmed by Mr. Boyd on the same general principle, but with various differences in detail, the principal ones being that he heated the air by coils of pipe instead of flat vessels, that his inlet flues were very different in dimensions to those designed by Mr. Lea, who represents Price & Co., and that no extracting apparatus was attempted beyond the provision of outlet flues with suitably protected exits. In this building, as well as in the other, a constant stream of pure warm air issues from every opening when the apparatus is going, and therefore there can be little doubt that the outlets work efficiently without the stimulus which in this instance the disposition of the building forbade my attempting. Here we have systematic warming combined with ventilation for the weather when the windows will not be opened, and I have little, if any doubt, that this is the best possible system to adopt in schools of large size; though of course the arrangement of different buildings may occasion modifications of the details. For summer weather of course ventilation by means of open windows and windows on more sides of each room than one is indispensable.

It has been sometimes customary to warm schools by taking the pipes into the rooms. This I needly hardly say is a very imperfect mode of ventilating, though it is a powerful mode of heating, and may fairly be employed as an auxiliary to the warm-air system I have described. The first cost is decidedly less, but the results would be less healthy. If, however, economy drives the architect to such an apparatus, he should beware of any high-pressure system. The high temperature to which hot-water pipes can be raised on the high-pressure system, renders their effect on the air of a school injurious to health and comfort. The sort of heat which is suitable for desiccating timber is not favourable to young children or their teachers.

Elementary schools, such as the ones I have described, are considered by those who have the best opportunities of judging, the most appropriate to the wants of a large and crowded metropolis like London, and to the requirements of our present system of teaching, and they ought to prove good models for town schools throughout England. For country schools they will in many cases be found too lofty and too elaborate. Where ground is plentiful and cheap there are great advantages in the erection of one-story buildings. From the plans of such schools of course the staircase disappears, some of the other arrangements become simplified, and the construction becomes altogether slighter. Country schools are, however, so familiar a subject to others, that I believe I may more profitably employ the remaining time if I turn from them to a newer subject, one bearing upon the elementary schools of the future, and the middle-class, and the higher schools of the present. I allude to the class-room system, or, as it is often termed, the Prussian system.

If this is a departure from the programme of the paper, I trust it will be pardoned me on the ground that the application of this system to elementary schools is a subject with which I am to some extent identified. Members reading papers here have generally, I believe, striven to select those parts of their subject (where a large field is open) upon which their own special studies or personal experience enable them to communicate information, which may at least have the value of not being readily accessible from other sources, and it is in conformity to this principle that I invite you to consider for a moment the models to which almost all large schools above the level of elementary schools are now conforming, and upon which I believe the elementary schools of the future may in all probability be shaped.

The schools of Prussia are perhaps the most complete to be found on the Continent of Europe, but those of many countries are formed on the same model. Collective teaching is exchanged in these countries for completely separate instruction; though means of assembling a considerable proportion of the children together are generally though by no means always retained. So many classes, so many class-rooms is the rule, and an infants' department is not found in these schools. The maximum number recommended in a room is 60, 70 being considered an exceptional number. The class-rooms are oblong; it is indifferent whether they be lighted from the end or the side, but they must be lighted from one side only, and the children must have the light on their left hand. There seems no limit to the depth from front to back of a block of seats, but the length of each bench is so limited as to allow the master to inspect every child's work from the end of the bench. For the purpose of facilitating this inspection, a gangway is preserved all round the block of children, narrow at the back and at the side nearest the windows, but made wide enough next the wall facing the windows to be convenient for the ingress and egress of the children; and the block of seats is broken up into at least two masses by an additional narrow gangway from front to back. No child ought to be more than 30 ft. from the easel where diagrams, &c., are shown, and it is recommended that, as far as possible, the seat most remote from the window be not further from the wall than one and a half times the height of the top of the window from the floor.

The master's desk, on a slightly raised platform, faces the block of children; an easel for the display of diagrams, &c., a book-closet, and the stove or fireplace, occupy the space on either side of him.

These class-rooms are ordinarily put together so as to form a compact oblong block of buildings several stories in height, three stories being usually met with, and are frequently divided on plan into three portions by two staircases extending from front to rear: one of these is for boys and the other for girls. These staircases, however, often occupy the end of the block, and sometimes a corridor connects them together; but this is sometimes omitted.

On an upper floor, and between the two staircases, is placed the aula, or general room, calculated to seat about half the number of children provided for in the class-rooms. This room generally receives some amount of architectural decoration; it is not customary for it to be divided by movable partitions or other means when not in use for collective teaching. Private rooms for the teachers, and sometimes one or more consultation-rooms, complete the essential parts of the building, which is heated and ventilated on a general system.

It is recommended that, as far as possible, the class-rooms shall have a sunny aspect, and also, to secure greater freedom from noise, that as many as possible of them shall face the playgrounds rather than a main road.

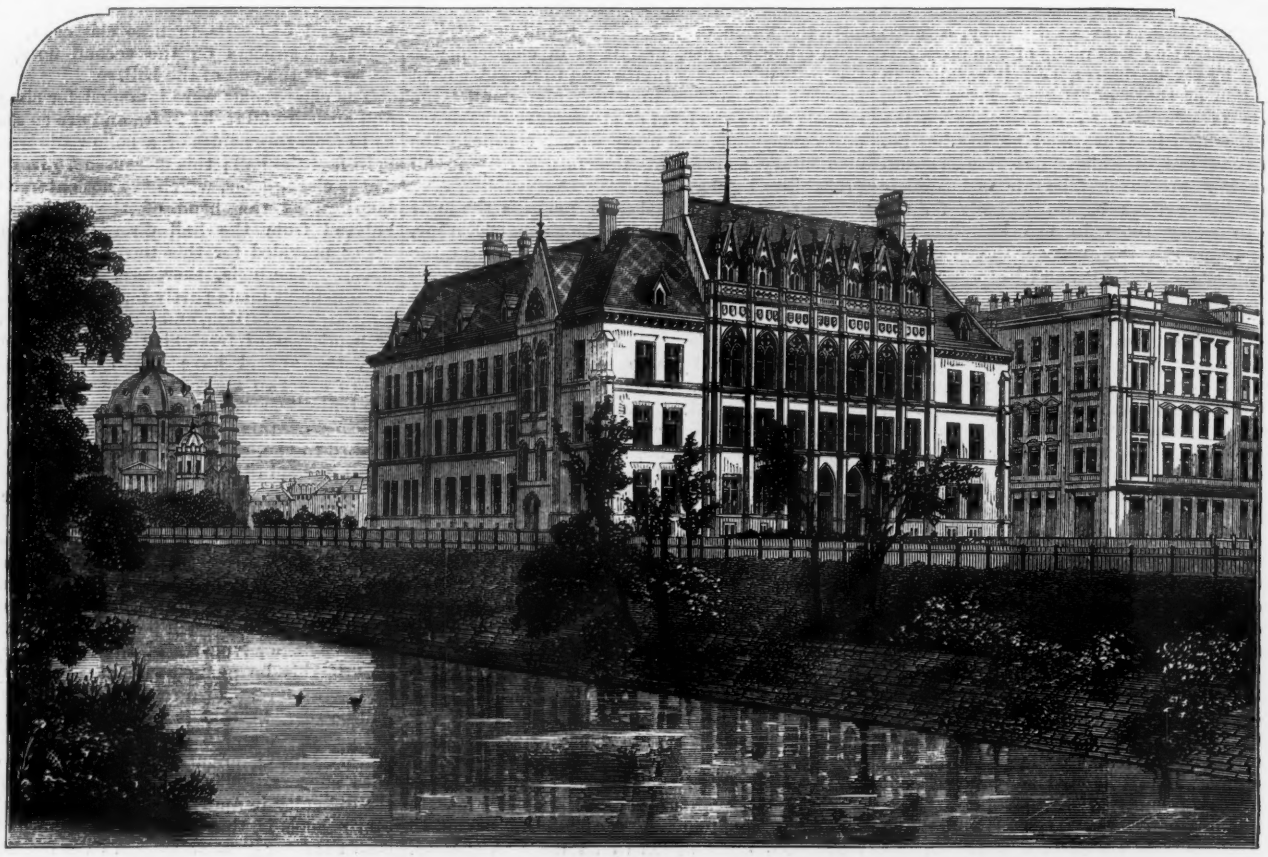
For the filling up of this outline I must refer you to Mr. Robson's book. In it he describes and illustrates many of the best examples of such schools as they are found in Germany, Austria, and Switzerland, and points out in what respect the system of teaching which has given use to them, is essentially different from ours. One of these class-rooms incloses within its four walls a little school in itself, and the teacher of it must be prepared to manage the children, and fit to instruct them without much support from without. A class in an English schoolroom, on the other hand, is constantly intrusted to a young boy or girl, who could not go alone for two hours together.

The school in Jonson-street, Stepney, built for the London School Board, from my designs, conforms very closely to the programme of one of these German schools, and is the only one on that model which they have erected. It accommodates the large number of 1,675 children,—of whom 575 are infants, occupying two infant schools on the ground-floor; 560 are boys, in nine classes, taught in eight class-rooms on the first-floor, one class being taught in the large hall; and 540 girls, in nine classes, occupying eight class-rooms on the second floor, and a gallery at the end of the hall.

The class-rooms were intended for sixty each, and measure 20 ft. by 27 ft., and are so arranged as to form three sides of a hollow square, which is in fact the hall; this measures 75 ft. by 40 ft. These class-rooms, which are not entered off the landings at the head of the staircases, are entered from the hall direct (a side gallery being provided for this purpose on the upper floor). There is, therefore, no corridor; an arrangement made partly for economy, partly to simplify supervision, and partly to secure a freer transmission of fresh air right across the building, than could have taken place otherwise. There are two staircases, one at either end of the building, and each staircase is double. The heating of this building I have already described to you, and having visited it repeatedly when in use in the winter, I find that the ventilating arrangements suffice to keep the class-rooms sweet.

I have pointed out that the progress of school-building, in the case of elementary schools, has been in the direction of isolating a larger number of classes or class-rooms than before, and no doubt better results will be obtained. It is believed by the advocates of the Prussian system, that if this be pushed further, and every class be taught on its own room, a still higher result will be reached, that is to say, the children will get on faster, and a larger proportion of them will pass the examinations of the different grades with success. This is extremely probable, but the difficulty in applying the system to elementary schools is, that it requires a more efficient staff than our present system calls for, and that such staff is consequently more expensive. The teacher of a large class of children shut up with him in a room must be fully equal to their discipline in all emergencies. In a schoolroom a pupil-teacher is considered equal to much of the work of teaching because if his class begins to get into disorder, the head teacher is within call and can come and restore discipline; but it is fair to observe that the instruction he gives is not always likely to be of the most mature description. The pupil-teachers' system may possibly not always be maintained in England. The Germans, and I believe the Americans, do not possess it, and even if we never see reason to discard it, there appears a probability of the proportion between the number of pupil-teachers and of trained teachers being altered. Even as it is, if a so-called Prussian school were so built as to allow the classes to be worked in pairs, the present allowance of teaching power would I think, enable class-rooms, say for 50 each, to be provided with a certificated teacher between the two, aided by a sufficient number of pupil-teachers to keep the two rooms going satisfactorily.

If the annual expense can be so arranged as not to be greater than in the present schools, or if the results can be shown to be so much better as to justify such an expense as is unavoidable, a second objection which has been raised to the system remains to be dealt with. This is the supposed increased costliness of the buildings unless they are planned for such large numbers as few neighbourhoods can supply. There is room to doubt the correctness of this objection. The Stepney School cost 7*l.* 9*s.* 1½*d.* per head, or if the architect's commission be taken into account, 7*l.* 16*s.* 7*d.* per head. The average cost of London Board Schools has been stated at 8*l.* 10*s.* (whether with or without architect's commission, I am not aware). This building therefore (which is very substantial), is sufficiently below this average to allow for some increase in expense, consequent upon building for smaller numbers, and still to leave it an average building. At Stepney, the infant's department is disproportionally small, but that defect is one admitting of easy adjustment. A more serious objection to the introduction of the system, than either the question of cost of teaching, or cost of building, is to be found in the doubt, whether the collective influence which the principal teacher now exercises over the whole department would be kept up. This, however, is a matter for which provision is made in the existence of the hall, which in English practice might well be made use of for all that collective teaching, and singing, which in an ordinary school takes place in the general school-room, as well as for public examinations, mustering, drilling, or inspecting the children.



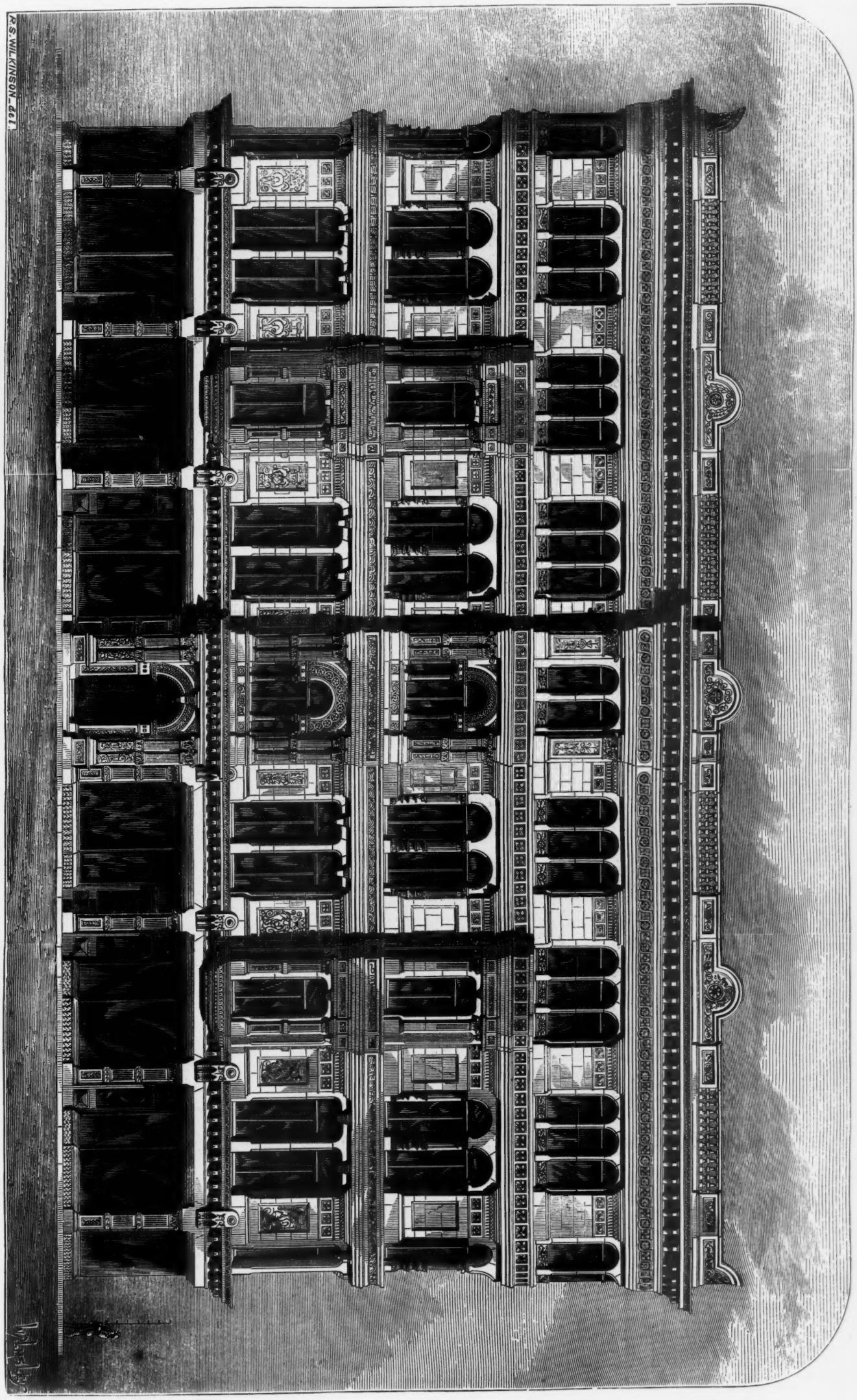
THE IMPERIAL GYMNASIUM, VIENNA.

IMPERIAL GYMNASIUM, VIENNA: THE AULA, OR EXAMINATION HALL. [See p. 451, *ante*.

IMPERIAL BUILDINGS, LONDON.

THIS is an isolated block of buildings, having a frontage to Queen Victoria-street of about 120 ft., bounded on the north side by Pancras-lane, and on the west by Size-lane. The style adopted is a modern version of the Italian Renaissance. The buildings are four stories in height, the ground-floor being devoted to shops and the entrance-hall to the offices. The first, second, and third floors are offices, the first two floors being each 15 ft. high. The double basement is of unusual depth, the foundation having to be carried down to the extent of 35 ft., in consequence of the depth of treacherous ground in the bed of the old Walbrook, which runs diagonally across the site, and while excavating this several antiquities were brought to light,—among them some Pictish and Roman pots and coins. It is proposed to place these in a glass case, to be fixed in the hall of the building when finished.

The first basement, which is 13 ft. high, is intended for a first-class restaurant, and is entirely separate from the main entrance and offices, and will include the whole area of the site. It will be supplied from the kitchen on the roof by means of a concealed staircase and a double dinner-lift. There will be a steam passenger-lift, in addition to the ordinary staircase, for those who choose to avail themselves of it. The staircase will be lighted from the roof by means of a large lantern cutting through the kitchen, with the walls decorated. The whole of the exterior and interior woodwork, including doors and sashes, will be of mahogany. The building is being executed from the designs, and under the superintendence of Mr. F. J. Ward, of Albert-buildings.



IMPERIAL BUILDINGS, QUEEN VICTORIA STREET, LONDON.—MR. F. J. WARD, ARCHITECT.

SUB-CONTRACTS AND PIECEWORK.

THE very interesting and valuable address on Co-operative Production, read by Mr. Thomas Brassey, M.P., at Halifax, has been published * and may be studied advantageously by all concerned with either capital or labour. The writer very properly urges that without first-rate ability *at the head* of an undertaking, whether co-operative or otherwise, failure must follow, and that individual ability cannot be had unless it is well paid for.

After mentioning some of the failures which have followed attempts to found co-operative establishments, Mr. Brassey points to a direction in which he thinks the principle might be, as it has been, usefully employed; and in doing so gives some particulars as to sub-contracting, which will interest many of our readers:—

"While the efforts to establish co-operative production in this country have not thus far been attended with a large measure of success; the importance of the principle at stake is so great, that I should deprecate most earnestly the abandonment of further attempts in the same direction. The wiser course will be to avoid, as it has been already suggested, commencing undertakings on a large scale. When the business is of a kind that cannot be carried out advantageously on a moderate footing, the co-operative principle should be applied to the execution of sub-contracts for portions of the work, to the supply of a part of a large order, or to the execution of a single process in a complicated manufacture.

When a railway contract has been taken, the principal contractor usually subdivides the works, and lets them out to sub-contractors. On a long line of railway every cutting, bridge, tunnel, embankment, and station, is executed by one or more separate contractors; and thus the co-operative system may readily be applied to the construction of every section of the largest undertaking, after it has been sufficiently subdivided. The same remarks apply to shipbuilding and many other branches of industry with the details of which I am less familiar, but where I am equally confident that the subdivision of the work will give ample scope for the application of the co-operative system, when, from the nature of the case, superior administrative skill and large resources at the fountain head are indispensable.

It may be interesting to men, who are engaged in a great effort to organise a new and better system for the application of capital and labour to production, to hear some details of the methods adopted by the English contractors, who have been engaged in the execution of great railway contracts both at home and abroad. In the conduct of these works the main object in view has been to give to the workmen a personal interest in the performance of an adequate quantity of work in return for the wages received. In the case of the contractor it was especially important to attain this object by making it the interest of the labourer to do his fair share of work, rather than by placing reliance on a close personal inspection of his conduct. With the development of railway enterprise, the practice was adopted of inviting English contractors with competent resources to undertake railway and other works, not only in their own country, but in every quarter of the globe. The difficulties of supervision of necessity increased with the enlarged area of their operations; and it was essential to devise some plan by which it should, if possible, be made an advantage to every individual concerned to perform his share of the common task to the best of his ability.

Thus the system of sub-contract and piecework, originally adopted by the pioneers of railway construction, was extended to every operation where it was possible to apply it. The general character of the arrangements may perhaps be best explained by the selection of an example taken from actual practice. On the contract for part of the London and South Western Railway, between Basingstoke and Winchester, there was an unusual proportion of excavation to make, amounting to some 3¼ millions of cubic yards on a length of eighteen miles. Not only were the works of a heavy and costly nature, but the time allowed for the completion was so short as to render the utmost diligence and energy necessary. The operations were carried on night and day, and 1,100 workmen were employed.

* London: Longmans & Co. 1874.

There was one particular cutting near Winchester, which, in the deepest part, was from 90 ft. to 100 ft. in depth. Here, in spite of severe and unfavourable weather, the works were pushed on with the utmost diligence and determination. This was done even at a considerable pecuniary sacrifice; because the contractor was anxious, above all things, to maintain and increase the good reputation he had already begun to establish, and of which he was wisely jealous as the surest guarantee for his future success. At Micheldever there was one immense embankment, about 85 ft. in height; and at Popham Beacons there was a short cutting, not more than 10 chains in length, intervening between two tunnels, of such a depth that 100,000 cubic yards were excavated in order to make the cutting.

The whole of these works were executed by sub-contract. The amount of work let to a particular sub-contractor was determined by the appreciation formed by the principal contractor or his agent of the ability of the individual to carry out the work. A man of superior qualifications was allowed to take a sub-contract for an amount of work, increasing in magnitude in proportion to the confidence entertained in his ability. Some of the sub-contractors would take contracts for work costing in the total 15,000*l.* to 20,000*l.*, and employing from 150 to 200 men.

Frequently the sub-contractor would again let his work to the navvies at so much a yard. They worked in what were called butty gangs, or parties of from six to twelve men. The navvies would take a contract under a sub-contractor for excavating so many yards of earth at so much per yard; and they would divide the earnings equally amongst each other. Disputes would frequently arise between the butty gangs and the sub-contractors upon the question of measurement, and in such cases the resident agent or representative of the principal contractor was required to arbitrate.

When the work was organised in the manner I have described, the function of the principal contractor was rather that of a practical engineer, superintending the execution of the works by a number of smaller contractors. The principal contractor, being responsible to the engineer for the faithful performance of the contract, had to watch very closely the work done by the sub-contractors, and to see that it was executed in such a manner as to satisfy the requirements of the engineer; but he was not directly the employer of the workmen or the navvies.

The policy was to avoid, as far as possible, engaging a large number of workmen by the day, and to pay every man concerned in proportion to results.

> 'If little labour, little are our gains:
> Man's fortunes are according to his pains.'

The system of sub-contract was carried so far, that I have been informed by the same experienced person from whom I have derived the facts already quoted, that the very scaffolding, raised for the purpose of putting together the iron-works of the bridges of the Severn Valley Railway, was mostly erected by sub-contractors. A carpenter would take a sub-contract for the erection of such scaffolding, fixing his price by the cubic foot.

It is always satisfactory to build our general principles, especially those which guide our action in the graver affairs of life, on as broad a foundation as possible."

THE REVISED DUBLIN MAIN DRAINAGE SCHEME.

IN their fresh report Messrs. Bazalgette and Neville make many alterations. Admitting that the engineers were compelled to revise their scheme to afford Dublin the chance of having a main drainage at all, this revised scheme throws a curious reflex upon the original one. The Borough Engineer of Dublin must have at least known that the first scheme, as a matter of cost, was beyond the capacity of Dublin, taxed as she was and is, to accomplish. Even the revised scheme can only be performed by instalments, and may be expected to drag its slow length along for a number of years, the city suffering in the meantime seriously as regards her public health. The following paragraph from the engineers' report is amusing if not instructive:—"We have effected a very large saving upon all the contracts by substituting what may be called the natural building material of the country, viz. rubble masonry, for brick work. The materials for forming rubble masonry are to be found—almost picked up—in all parts of Ireland, and every country labourer who has ever handled a trowel can build a rubble wall; so that it is much less costly than brickwork, and the work, though rougher, is as strong and enduring as brickwork."

Happy Dublin, your agricultural labourers are in for a long job. There is little need for skilled labourers in the execution of your main drainage work. On the principle that every country labourer who can handle a trowel can construct a sewer, why not utilise every handy builder's labourer for the leading men and foremen? It would be a great saving, and would no doubt considerably reduce the cost of construction and supervision, whatever might be the ultimate consequence. Messrs. Nowell & Robson are the lowest for No. 1 contract, at 205,494*l.*, and Messrs. Smith, Finlayson, & Co. for contracts Nos. 2 and 3, at 118,000*l.*

The engineers, in their report, say that it should be a condition of the acceptance of any tender, that the contractor should submit a priced schedule of his tender, and the corporation should not bind themselves to proceed with the entire works, but with certain portions of them, named. This provision is intended to protect the corporation from any obligation to provide money to pay for the construction of additional work which might be found necessary if the contractors were allowed to proceed with any amount of work involving a cost greater than what is provided by the borrowing powers of the municipal body.

THE VICTORIAN INSTITUTE OF ARCHITECTS, MELBOURNE.

AT the last annual dinner of the Victorian Institute of Architects, his Honour Sir Redmond Barry, the president of the Institute, presided, the vice-chair being taken by Mr. Lloyd Tayler, the vice-president.

The President, in returning thanks for the manner in which the toast of his health had been proposed and responded to, said there were many great objects before the Institute. It should be their aim to lift their profession from the level of a mere trade. Architecture was the language of the intellect indelibly impressed upon the surface of the earth by great minds, and those present should be proud to belong to a profession which had stamped its excellence throughout the world amongst all nations. There was a noble task before them in this new country. They should not content themselves with being the imitators only of those who had preceded them, but should turn their whole heart's desire to become originators. Each age had generated some new idea; and were architects alone, amongst all the followers of the fine arts, to be the servile imitators of the past? In the ages that had passed, all the great works of architecture were almost exclusively associated with religion; but although the present age was more secular, there was no reason why the same earnestness should not be exhibited in the promotion of equally elevated ideas. The earnestness of the architect should be impressed upon his work, and a strict regard should be paid to the principles of his art, unity of design and fidelity of execution. He should disregard the spurious feeling of the moment for meretricious decoration. In the city of Melbourne types of all kinds and conditions of architecture might be observed. To the eye of some future historian it might seem as if the place had been overrun and devastated by successive races, each of which had left behind traces of its existence in the relics of the different styles of architecture that prevailed among them. He thought the architects ought to aspire to some original conceptions. There was one other matter to which he desired to refer. He believed that justice ought to be done to the profession, and he considered that by the present mode adopted with regard to great public works, but scant justice was done to the architects. Instead of some trifling reward of 200*l.* or 300*l.* being given as a prize for the first plans of a building, the successful architect should be allowed to carry out and complete his own design.

Mr. A. E. Johnson proposed the toast of the "Public Works Department," and expressed his belief that under its present head it was one of the best managed departments of the service.

Mr. W. W. Wardell, in replying, remarked that

he department had had a good many "roughs," if he might use the term; but, as his friend Mr. Higinbotham had observed, they were not very much the worse for them. He attributed the success of the department to the excellent officers by whom he was surrounded, amongst whom he had formerly been able to count his friend, Mr. Johnson. With respect to the remarks of the president, he might mention that the practice he recommended had already been followed in two of the large public buildings which had recently been competed for. He hoped the gentlemen who were to carry out their designs would receive not hundreds, but thousands.

VALUATION OF PROPERTY BILL.

THE Bill introduced by the President of the Local Government Board has been issued. It provides that from the passing of the Act the poor-rates shall extend to land used for a plantation or a wood, or for the growth of saleable underwood; also to rights of fowling, of shooting, of taking or killing game and rabbits, and of fishing, when severed from the occupation of the land; also to mines of every kind not mentioned in the Act of the 43rd of Elizabeth. The gross and rateable value of any land used for a plantation or a wood, or for the growth of saleable underwood, is to be estimated as follows:—If the land is used only for a plantation or a wood, the value shall be estimated as if the land, instead of being a plantation or wood, were let and occupied in its natural and unimproved state. If the land is used only for the growth of saleable underwood, the value shall be estimated as if the land were let for that purpose. If the land is used both for a plantation or wood and for the growth of saleable underwood, the value shall be estimated either as if the land were used only for a plantation or wood, or as if the land were used only for the growth of the saleable underwood growing thereon, as the assessment committee may determine.

PROPOSED NEW PUBLIC HALL AND MECHANICS' INSTITUTE FOR BARNSLEY.

FOR some time past, the want of a public building, suitable to meet the wants of a prosperous town like Barnsley, has been felt. Although numerous schemes have been set on foot to secure the desired object, it was not until the close of last week that a decision was come to for securing this much-desired boon. At the present time, the largest building in the town is what is known as the Mechanics' Hall, which was erected many years ago, and used as a theatre. That erection will only accommodate a few hundred persons in any but a satisfactory manner; and often, when important meetings or lectures are being held or given, the place is crowded to such an extent as to render it uncomfortable to those who are fortunate enough to secure a place. The contemplated building is to be erected by a company known as The Barnsley Mechanics' Institute and Public Hall Company (Limited), with a capital of 16,000*l.*, in 3,200 shares of 5*l.* each, of which 1,600 are ordinary shares, and 1,600 are preference shares. The directors are eight in number, and comprise the mayor, ex-mayor, and a number of very influential persons. The company propose to secure a very advantageous and central site in Eldon-street, near the two railway stations, and in one of the best thoroughfares in the town, at a cost of 3,150*l.* On this site they propose to erect a public hall, capable of seating at least 1,500 persons, and costing from 12,000*l.* to 13,000*l.* The site is at present occupied by a portable circus, belonging to Mr. Charles Adams. The building is to provide accommodation for the Mechanics' Institute, who are to have set apart to its wants a spacious reading-room, news-room, a library, and class-rooms, together with suitable apartments for a resident librarian, with lavatory and other necessary accommodation. As it is thought the site is too large for the purpose named, it is suggested that shops, offices, or other buildings may be erected, so as to utilise the site. It is intended to award to the Institute the right of using the large hall twenty-five nights in the year, for lectures and other purposes, at a maximum rent of 50*l.* per annum. 8,000*l.* of the capital will be raised in ordinary shares, and 8,000*l.* in preference shares; the former to receive no dividend in any year until the 5*l.* per cent. be paid on the preference shares. It is generally believed that the capital will be provided, and the building at once proceeded with.

ST. MICHAEL AND ALL ANGELS, ENFIELD.

THIS church has just been consecrated, but there remain yet three bays of the nave, and the tower and spire to be built. At present the chancel, with its aisles, and three bays of the nave and aisles, and the north transept, have been erected. The nave is lofty, and has circular traceried clearstory windows: the ridge line is carried through to the chancel, which has two bays, and a five-sided apse. The nave roof is open, that of the chancel is panelled, but instead of wooden trusses, the roof is carried on the chancel arch, the sanctuary arch, and an intermediate stone arch, between the clearstory windows, which rests on a slender shaft carried down in front of the central column of the chancel arcade. The apse is vaulted with brick, with stone ribs, and in each side is a two-light window, the cills of which are kept up above the clearstory string. The material is Kentish rag and Bath stone for the outside, and red brick and stone inside; the nave, however, has plastered walls. The church has been built from the designs of Mr. R. Herbert Carpenter, and under the superintendence of himself and Mr. T. J. Hill, of Enfield, by Mr. Bentley, of Waltham Abbey.

DEATH IN EXCAVATING A WELL.

JOSEPH SALLIS, a well-sinker, has met with his death while sinking a well at No. 1, Naunton Park-villas, Cheltenham. It appeared at the inquest that he had for many years worked for Mr. Barnett, well-sinker, and was working with others for him at the time of the accident. Where they first began to do this they came upon a drain or sewer, and the deceased thereupon commenced sinking in another place, without consultation with his employer. He had got down nearly 15 ft. through the light sandy soil, when he called out that the earth had given way. Catching hold of the rope, an attempt was made to pull him out, but he was too firmly embedded in the sand, and called to a fellow workman to come and dig him out. Horlick jumped down into the hole to do so, when immediately a second fall of soil occurred, windlass and all falling in, and Horlick was covered up to his neck, and the deceased was buried some 3 ft. or 4 ft. Horlick was with difficulty rescued, but Sallis was not dug out for some time, and was then, of course, quite dead. Mr. Barnett stated that the deceased had had great experience in well-sinking, having worked at it for many years, and himself had the direction of the work. In reply to the jury he said that he had sunk a well only a few yards from this spot to the depth of 15 ft. without "steining" or building up the sides, and without accident, and he attributed the accident partly to the fact that the well was being sunk, without the deceased being aware of it, too close to the spot where a trial shaft had been sunk, and the space between the two being insufficient, the sides of the new sinking had fallen in. The jury returned a verdict of "Accidental Death," but were of opinion that a well should not be sunk more than 7 ft. in a sandy soil without bricking up the sides.

THE DWELLINGS OF THE POOR.

MR. JOHN ELLIS, of Seacombe, has patented some improvements in the construction of dwelling-houses. The proposed plan is to construct buildings with only one central chimney or shaft containing flues, by which would be avoided a necessity for numerous and expensive chimney-stacks, lead flashings, &c. He claims that the fire-places being arranged in immediate connexion with the main shaft the result would be a continuous current, carrying off the vitiated air, making smoky rooms an impossibility, and by the centralisation of heat diffuse the caloric at an even temperature through the various departments, and by a simple arrangement in supplying the air necessary for combustion, prevent draughts. Hot-water cisterns being fixed in connexion with the shaft, would economise fuel. Among other advantages mentioned are greater facilities for the admission of air and light from the outer shell of the building, owing to the centralised position of the heat-producing apparatus; lessening danger of fire by the improved construction of buildings; by the non-necessity of joists being placed in juxtaposition with fire-places. It is proposed to place all drains outside buildings, thus preventing the pervasion of noxious effluvia, and offering greater facilities for any repairs required, without the risks so often incurred. Mr. Ellis has constructed elaborate models to illustrate his invention.

Could not heat be further economised and distributed by some mode of arranging fire-places in the middle of a room, so that to sit "round the fire" would be possible?

In the Commons, Mr. Kay-Shuttleworth has asked the Home Secretary when he would be able to lay before the House, or to give notice of, any amendment of the standing order with reference to powers given to railways companies to take possession of property and eject the tenants. In reply, Mr. Cross said the standing order was already drawn up in draft and would be laid before the house. Although not proceeded with before the recess, it would be immediately afterwards.

THE RICHMOND WATER SUPPLY.

THE plans of Messrs. Russ & Minns, civil engineers, London, have been accepted for the improved water supply of Richmond by means of an artesian well, and a reservoir which the Government Board of Works has consented shall be in the best position, Richmond Park, where it can be made wholly underground, and the surface be made quite flat; this arrangement by consent is considered a great boon. The well and pumping-station will be at the old brewery. The engines, pumps, and boilers will be capable of raising thirty gallons per head per day for 16,000 persons in twelve hours; the engines will be 40-horse power nominal and in duplicate. The well will be from 10 ft. to 5 ft. 3 in. diameter, and lined with iron cylinders, as far as the chalk, which is at a depth of about 257 ft. If required, a boring of about 150 ft. in depth will be made in the chalk. Following is a section of the different strata through which the well will be sunk:—Surface soil, gravel, &c., 15 ft.; London clay, 157 ft.; mottled clay, 38 ft.; sand, 47 ft.,—total 257 ft., at which depth the chalk will be reached. The estimate of the cost is 28,362*l.*, but judging from some remarks made by Mr. Hawksley, who was examined before the Government Commissioner as to the feasibility of the scheme, it is probable that this will be slightly exceeded, in which case the Vestry will have to make a second application to the Local Government Board for permission to borrow a further sum. The annual working expenses are estimated at 724*l.* Hydrants will be available for street watering, and the water cost 2d. to 2½d., per 1,000 gallons, where by the present system it costs two shillings. Mr. Russ was the author of one of the premiated drainage schemes for Winchester, and his firm is now engaged in carrying out works connected with the water supply of the new docks at Portishead, near Bristol.

THE RIVER APPROACHES AT LIVERPOOL.

THE new river approaches are now not far off completion. Another addition to the new work has been made by a portion of the connexion between the George's and Prince's landing-stages being brought across from Birkenhead and placed between the stages where it was to be permanently fixed. The connexion is over 500 ft. long, by 123 ft. wide at the broadest portion, and 83 ft. at other parts, with an embayment for facilitating the transshipment of goods. It has been constructed at the works of Messrs. Brassey & Co., and was brought across the river by five steam-tugs. The work was necessarily one involving considerable risk and difficulty; but the huge raft was successfully piloted over without any accident. Tackling ropes were fixed to the pier walls, and, by means of windlasses on the stage itself, the stage was gradually pulled towards the wall until it had reached the desired distance. Meanwhile, a new bridge and a "boom," which was intended to steady the stage, had been got ready. The ends of these were supported on what may be called large floating rafts, the tops of which were much higher out of the water than the level of the stage. As the tide receded, these were so arranged that the end of the bridge in the result was left resting on the stage, when the jointure with the stage was as quickly as possible thereafter made. The connexion between the two stages was then, therefore, nearly complete, but a number of pontoons had yet to be put in. The dock engineer, Mr. Lyster, was present during the greater part of the time.

HINTS TOWARDS A CLEAN HOUSE.

ARCHITECTURAL ASSOCIATION.

AT an ordinary general meeting of the members, held on Friday evening, the 15th inst., the President (Mr. C. J. Tarver) in the chair, the following gentlemen were elected members:—Mr. W. C. Sandys and Mr. W. J. Millard.

The Secretary (Mr. Bowes A. Paice) proposed votes of thanks to Sir Gilbert Scott for his kindness in allowing the members of the Association to visit for the third time the New Home and Colonial Offices, Westminster; and to Mr. Sheffield, clerk of the works, for explaining the various features of interest in the building.

Mr. Thomas Blashill then read a paper on "Hints towards a Clean House." He commenced by stating that it was the air within a dwelling-house which was of the greatest importance to them, and that, however it might be warmed, dried, or filtered, it could never reach the purity of the air out of doors. Its condition depended largely upon the cleanliness of the house, and the facilities for removing from it all dirt and all refuse before they showed any signs of decay. The great mischief of dirt was not in its unpleasant smell, but in the poisonous gases which it exhaled, and the germs of disease which were harboured and developed by it at a later period when it had perhaps ceased to be very obnoxious to the sense of smell. Now the period during which the worst kind of refuse might be kept before any great change began was about four-and-twenty hours, and perhaps two days might be taken as the extreme safe limit of time during which arrangements must be made for getting it clear away from the house. With other kind of refuse the matter was less pressing, but it seemed a safe and convenient rule to ensure the *daily* cleansing of the house from all the grosser forms of dirt. The modern system of drainage aimed at doing this by a process which was self-acting and continuous, and, when efficiently carried out and properly used, it was cleanly, convenient, and free from material objection. House refuse was of four kinds:—1, dry refuse, such as dust and the ashes of fuel; 2, refuse arising from the operations of cookery; 3, water that had been made foul by house-cleansing; and, 4, chamber-slops and night-soil. A house should be surrounded by a clean space and approached by clean paths, none of which should require much labour in cleaning. Wherever floor-coverings of the oil-cloth or kamptulicon class could be used they favour cleanliness, but the boards must be thoroughly dry or they would decay. The wall should have a chair-rail rather than a classical dado moulding, the projection the same as that of skirting, and the space below it finished in some way that would admit of its being washed. The rest of the wall might be finished more delicately in flatted paint or some paper not glazed, but like the French papers in surface. Flock-papers harboured the dust, they even added to it, but a painted flock had much of the warm effect and was also clean. There were washable papers of good colours and dead surfaces more suitable for staircases and for dados than varnished marble papers, which attracted the damp. Damp was a form of dirt which aggravated its other forms. In addition to the usual precautions against it, he always put 6 in. of concrete over the whole site of a house. A wall built of very hard compact bricks, or hard stone laid in hard setting mortar, and finished inside with a smooth surface, would extract all the moisture out of the air within the house, and at the change from cold to warm weather, the water would run down it and stand in pools on the floor. The careful airing of a house assisted by fires, in damp as well as in cold weather, was most necessary. Gas was a modern source of damp; it produced an enormous quantity of water, which would condense on walls and in all unventilated closets, wardrobes, and cool places. In a house of good size, built from his design, he had calculated from the gas-bill that over a gallon of water per night was so produced during the winter months. The great bulk of dust in houses consisted of particles worn from furniture and clothing, the ash of wood and coals, and dirt from roads. Professor Tyndall says that dirt was a most important agent of evil by harbouring and carrying about with it the germs of disease. They knew that houses were generally so constructed that it was impossible to keep them even tolerably free from dust. Mere dry dusting was but the removal of dust from one place that it may settle in another. Dark unventilated cupboards, handy places managed under stairs and sinks, and between rooms, require ventilation and light. Tall cupboards should reach to the ceiling; drawers should be few, and only for special purposes. Mouldings harboured dust, as did all little ledges, while shelves not above the level of the eye get cleaned. In fireplaces, the flue should be made to fit well to the opening of the register, and should be free from bends and large open spaces; there would then be less deposit of soot. The ordinary kitchen range wasted coal, and covered all the vessels used in cooking with bituminous soot. A few white marble shelves, a little marble wall-lining, or at least slate, in a perfectly well-lighted and ventilated larder, would soon repay their cost in the prevention of waste, and the air of the house would be relieved of the smell of meat which hung on hand. He would recommend a common meat-safe nailed against a back wall rather than a miserable pantry with a borrowed light, and all the damp and dirt which that entailed. Dust should be kept in a galvanised pail, and collected three times a week at a given hour. In a country-house the dust proper and the waste kitchen stuff should have two neat pails, with covers, provided and placed upon a small hand-truck near the scullery door, so that they could be taken away and returned clean early every morning. The sink should be outside the house, in the pavement of the yard, with a tap over it for drawing water for outdoor use. The pipe from the ordinary domestic sink should go through the wall, and dip into the water of the yard-sink, A good ordinary stoneware trap set in a mass of concrete, with two or three courses of brickwork in cement forming a 9 in. square cesspool over it, would form a good yard-sink. It should be covered with a stone having a 9 in. hinged grating, the waste-pipe being brought through the brickwork just below it. This trap could be cleared out easily, and if the sewer air forced itself past the "dip" it would escape into the yard and not into the house. All foul water in large quantities should be poured into the yard-sink, and a good flush of water should be put down the house-sink every night when the sink was cleaned. A housemaid's closet should be fitted with a housemaid's sink, which was made like a hopper-pan having a trap formed at the outlet.

With regard to water used for cooking and drinking, it should be kept in a cool light room, easily accessible and free from dust. Separate taps should be provided for drinking water from those fixed at sinks. With regard to bath-rooms, the chamber and the lavatory, where the liquid refuse was very largely diluted, the precautions required for getting it out of the house are the same as in the case of sinks. All the waste-pipes should be kept clear from closet soil-pipes. From some source or other there should be a regular flow of water into all traps. There should be a good lavatory for gentlemen in any house of fair size. One or two closets might lead out of the lavatory and a separately lighted and ventilated urinal, its basins discharging into the closet drain, be placed there. As regards the old-fashioned pan-closet, he believed that it kept in work for a longer time than the valve-closet without disablement. But at the best it was a harbourer of dirt, the water traps formed in and below it being liable to be rendered useless; and it was upon the whole much inferior to the class of valve-closets, of which three and four kinds were well known. The soil-pipe should run down close to an outer wall and be properly connected with 6 in. stoneware bend turning through the wall and running thence to the sewer, cesspool, or other termination of the house drainage. The air in a good sewer, though unpleasant when they smelt it in the streets, was purer than the air could be in a house-drain or soil-pipe, and might be the least of two evils.

In a country-house the question arose as to the disposal of the sewage. Practically all the liquid from sinks, baths, and lavatories would give little trouble. In most cases it could be received in a tank and used in the garden or turned at night over fields. The closet-drainage was the difficulty. Closets might be so constructed, and all the means of draining them so carried out, that no perceptible nuisance would arise from them. Wherever the earth-closet could be employed under proper arrangements they could ensure perfect cleanliness; and if they would but take the trouble they would be quite free of cesspools and sewers. The earth-closet might be put on the ground-floor story, and indeed in any story where convenient access for the attendant could be secured. It should have its ventilated lobby; and the filling of the hopper and removal of the pail should be effected, if possible, from a small chamber external to the closet. Special lifts were contrived for raising dry earth and for lowering the soil through two or more stories and pipes or shafts had been made that would discharge the contents from an upstairs closet down into a small chamber in basement. Great care should be exercised in keeping the shaft perfectly clean. Such shafts (and pails as well) should be white enamelled inside. For perfect action of the apparatus the pail was better than the tank. No large accumulation should be suffered within the house, and the closets should be cleaned every day. The earth must not be spread on the surface of a garden nor near the house, but must be dug into the ground or used out in the open fields. For cottages the apparatus was generally considered to be too complicated unless where a whole village was systematically worked on this system. A perfectly dry receptacle might be made into which earth might be put by hand; but as the apparatus was now much used for schools its application to cottages was only a question of time. With respect to the general application of this system to towns the obstacles were very serious. To his mind they were mainly within the house. As to the difficulties and cost of collection, it was not unreasonable to set that up as a serious obstacle. When the majority of townspeople feel that the nuisance of the daily visit of a scavenger to the house was less than that arising from old-fashioned closets and drains, and when the majority could compel the minority the thing would be done, if ever; and there was no doubt that the public authorities could manage the out-door arrangements.

THE CITY FRUIT AND VEGETABLE MARKET COMPETITION.

AT the last meeting of the Common Council, Mr. Thomas Rudkin brought up a report from the Markets Committee upon the reference to obtain designs for a new fruit and vegetable market, and recommending that the premiums should be awarded as follows, viz.:—300*l.* for the design sent in under the motto "Estelle"; 200*l.* for the design sent in under the motto "Wholesale and Retail"; 100*l.* for the design sent in under the motto "Anchor"; and also recommending that the sum of 50*l.* should be paid to each of the authors of the designs sent in under the mottoes "Plan," "Well Studied," "B," and "Westminster," upon condition that the designs become the property of the Corporation.

The report was ordered to be printed, and the consideration of it was adjourned.

SIR,—When the designs for the Law Courts were exhibited, some enterprising photographer, whether under subsidy or not, photographed and published them, a large proportion of the members of the architectural profession being purchasers. As six designs are to be premiated for the new Fruit Market, will you allow me, through the medium of your journal, to suggest a similar course. The sums received in shape of premium may be all very well in their way, but the successful men, I think, would be advantaged by having their designs made public.

ONE OF THE PREMIATED.

ARCHITECTS' ACTIONS.

KINGSTON COUNTY COURT.

Walker and Elsam v. *Metropolitan Board of Works.*—Mr. Sherrard appeared for plaintiffs, who are surveyors, carrying on business at Hampton Wick; and Mr. Napier Walker for the Metropolitan Board of Works.—Mr. Sherrard said the action was to recover 6*l.* 17*s.* 6*d.*, of which six guineas were for attendance at Westminster Police Court on three several days; the balance was for travelling expenses. One of the plaintiffs (Mr. Elsam) was served with a *subpœna* to appear before the magistrate on Jan. 20 to produce plans, sections, and drawings prepared and used by them connected with certain works being constructed for Col. Augustus Clifford. He (Mr. Sherrard) instructed counsel on behalf of Col. Clifford; and the case was on for three days.

Mr. Elsam attended, and though not called, he was present the whole time. It might be said that the *subpœna* only directed him to appear on one day; but in answer to that he might say his plans were there. The Board had given Mr. Elsam 5*s.*, which was supposed to cover his expenses for three days. It might be said that the scale of fees in the police court would not allow of more than 5*s.* being paid; but he was pleased to say there was no scale of fees by which only 5*s.* could be paid: but it was left to the magistrate's discretion. The *subpœna* was issued out of the Queen's Bench on the Crown side; and the scale of fees fixed for professional men was from one to two guineas per day, and a mileage of 1*s.* per mile. The charge of 1*s.* per mile had not been made, but only the railway and cab fares, amounting to 16*s.* 6*d.* Mr. Elsam having given evidence, the Judge asked why he attended the court after he produced the documents.

Mr. Sherrard was afraid that if he had not attended

the counsel for the Board would have made a great point of that.

Mr. Elsam stated that at the end of the first day he asked Mr. Philbrick, who appeared for the Board, whether he would be required to attend the second day, and Mr. Philbrick said he did not know.

Mr. Walker was about to cross-examine the witness, when the Judge asked him whether he was a solicitor. He replied that he was not, upon which the Judge said he could not allow him to examine the witness, or make an address.

Mr. Walker said that he was instructed by the Board that the case was important, because it was a matter of principle.

The Judge.—The Board ought to have been represented by counsel. I cannot allow things to be done in this way. I find for the plaintiff.

THE COVENTRY SEWAGE WORKS.

SIR,—I feel sure that you will kindly, in the interest of justice, afford me space to give an unqualified contradiction to the note you were called on to insert in your last issue, stating that the Coventry sewage works were planned by Mr. Baldwin Latham, C.E. The truth is, the works were designed by me, and I have also acted as executive engineer in carrying them out, an arrangement which has, in a great measure, contributed to their success. I would, however, in justice to others, say, that at the time of planning the works, General Charles Scott, R.E., and Mr. Baldwin Latham, C.E., both then directors of the General Sewage Company; and Dr. Anderson, the inventor of the process employed, as well as others, afforded me several valuable suggestions.

JOHN CHARLES MELLISS, A.I.C.E., F.G.S., F.L.S.

CASES UNDER THE BUILDING ACT: WOODEN BUILDINGS.

Mr. MILLIS erected an out-building on premises in his occupation, and was summoned by the District Surveyor of Hammersmith for not giving notice. Mr. Claydon, solicitor, defended; and Mr. H. W. Napier, of the Metropolitan Board of Works, attended in support of the summons on behalf of the District Surveyor.

The out-building in question was inclosed with wooden boarding fixed to posts of wood which were driven into the ground, and to other woodwork secured to a brick wall (abutting on a public way) by means of iron holdfasts. This being denied on the part of the defendant, in addition to an objection to it being deemed "a building," the Magistrate granted an adjournment to enable the District Surveyor to bring further evidence. At the adjourned hearing this was forthcoming, and the magistrate consented to visit the spot with the parties, when it was found that in the meantime the wood posts had been cut asunder and the building detached from the wall; the defendant now alleging that as he used the building for keeping fowls he had thus rendered it a "bird-cage," capable of being removed to any part of the premises.

The Magistrate remarked that as its removal appeared so easy he should order defendant to remove it to a distance of 8 ft. from the public way; then he thought the requirements of the Act would be sufficiently met. He was fully aware of the difficulty the District Surveyor found in dealing with such erections, and added that in his opinion he (the District Surveyor) had acted perfectly right in bringing this case before him.

The summons was then withdrawn, costs being applied for by defendant and refused.

A SATISFACTORY CONTRACT.

A REPORT has been received by the Holborn Board of Guardians from the building committee, stating that they had viewed the new administrative block of buildings at the City-road Workhouse, and unanimously resolved, on the motion of Mr. Moreland, seconded by Mr. Emms, "That this committee desire to express their great satisfaction at the admirable manner in which Mr. G. Wall, the contractor, has carried out his contract, in building this new block of administrative works, under the able direction and superintendence of the architect, Mr. S. Snell, and the clerk of the works, Mr. Manair." Mr. Abrahams, chairman of the building committee, moved that the report be approved. Mr. Southee, chairman of the Board, was glad to hear such a report, for he had always looked upon Mr. Wall as an honest, straightforward man, and one who did his work well. The resolution, for approving of the report, was then carried unanimously, and a copy was ordered to be forwarded to the gentlemen named in the report of the committee.

THEATRE ROYAL, HAYMARKET.

THE three scenes which have been painted and built up for the new "picturesque comedy" written by Messrs. Henry & Athol Mayhew are of themselves sufficient to justify the recommendation of a visit to the Haymarket. These represent the Garden and Courtyard of the Hotel at Chamouni, executed by Mr. G. Morris; the Grands Mulets on the Alps, Alpine sunset, changing to moonlight, by Messrs. O'Connor; and the Market-place of Chamouni, by the same artists.

In the first we have the *salle à manger* at the back, with the *table d'hôte* going on, built-out balconies, flower-beds, practicable pump, guests arriving, and all the life and bustle of the real place. In the scene on the Alps, the well-known hut, with its smoking chimney-pipe, the surrounding peaks, the characteristic guides, give a similar effect of reality; and this is equally preserved in the bright picture of Chamouni at the back of the market-place, with the syndic's châlet, the street-front of the hotel, and a flowing fountain in the centre of the stage. If anything, the scenery, supernumeraries, and accessories are too much for the story of the comedy, which is but slight. Still, carried out as this is by Mr. Buckstone, Mr. Kendal, Mr. Howe, Mr. Rogers, Mrs. Chippendale, and Miss Amy Roselle, the play runs merrily on; and Messrs. Mayhew and all concerned may be safely congatulated on a very successful result.

HUGHENDEN.

A MONUMENT has just been erected in the parish churchyard of Hughenden, to the memory of the late Viscountess Beaconsfield, wife of the Prime Minister. In character the monument is semi-mural, being attached to the church walls beneath the east window of the Simon de Montfort Chapel. In the centre is a trefoil arch, and on either side are lancet arches displaying the three recessed slabs of polished red Scottish granite on which are cut the inscriptions. Small marble shafts with carved caps support crocketed canopies over these openings, and in the cornice is a band of carving, representing in stone various roses, lilies, passion-flowers, foliage, &c. The following is the inscription upon the centre tablet:—

"In Memory of
MARY ANNE DISRAELI,
VISCOUNTESS BEACONSFIELD
In her own right,
For thirty-three years the wife of the
RIGHT HONOURABLE BENJAMIN DISRAELI,
Lord of this Manor,
Ob. December 15, 1872."

On the right-hand tablet is written:—

"In Memory of
JAMES DISRAELI, ESQ.,
One of Her Majesty's Commissioners of Inland Revenue,
And third son of
ISAAC DISRAELI, ESQ.,
Of Bradenham, in this County,
Author of the "Curiosities of Literature,"
Ob. Dec. 23, 1868."

And on the left-hand panel is the inscription:—

"In Memory of
SARAH BRYDGES-WILLYAMS,
Relict of James Brydges-Willyams, Esq., of Carnanton,
in the County of Cornwall, and Colonel of the
Royal Cornish Militia.
She died at Torquay, 11th Nov., 1863, and was buried
at her desire in this vault."

The materials are of polished marbles and granite and brown Portland stone. The work has been carried out by Mr. S. Sansom, of London, from the designs of Mr. Arthur Vernon, architect, High Wycombe.

ACCIDENTS.

Fire in Leather-lane.—With regard to the destructive fire in Leather-lane, Holborn, Capt. Shaw, of the Metropolitan Fire Brigade, officially reports that it broke out in a building in Nag's-head-yard, Leather-lane, in occupation as workshops of fourteen different persons, whose names he gives, including veneer, ivory, fret, glass, and diamond cutters; brush-makers, metal polishers, box-makers and wood-turners; that two-thirds of the building, with the roof, were destroyed, and the rest very severely damaged; that the first and second floors, and the roof of an opposite building, occupied by a box-maker, were destroyed; that the back windows of the Nag's Head Tavern, and of the house, No. 38, Leather-lane, were burnt out, and the back rooms much damaged; and that the fronts of four other houses in Leather-lane and two in Hatton-garden were scorched. The origin of the fire is, he says, unknown. The majority of the occupiers, who are the principal sufferers, are uninsured. A large number of men will be thrown out of work by the disaster. Fourteen steam and manual fire engines attended the fire.

Explosion of Gas in a Church.—An explosion of gas took place in St. John's Church, Chelmsford, which is undergoing alterations. The seats along the aisle were blown to pieces, and the painted windows were forced out; but the men who were at work fortunately escaped serious injury.

Gas Poisoning in Manchester.—Mr. John Kelsall, market gardener, of Timperley, who has for a great number of years attended Smithfield-market with produce, retired to rest, accompanied by Mrs. Kelsall, at their temporary lodgings, the Higher Turk's Head, Shude-hill. They were discovered in an unconscious state in the morning. It appeared that through being unaccustomed to gas, they had blown out the flame without shutting off the tap, and in consequence had been breathing the gas all night.

Sad Death of a Carpenter.—A carpenter in the employ of Mr. Hinton, of New Swindon, ran a small splinter from a plank into the inside of his left thumb, near the joint. Little notice was taken of the matter for some days, when symptoms of mortification set in, and a poultice was applied. The splinter came out, but the inflammation extended with such rapidity that the poor fellow died. He leaves a wife (who, singularly enough, has been suffering for the last two years from an injury to her hand, caused by a fall) and a family of small children.

STAND ACCIDENT AT LINCOLN RACES.

MR. WM. CULLINGWORTH, Turk's Head Inn, Sheffield, who was injured by the fall of a stand in the "ring" at the late Lincoln Spring Meeting, has died at Lincoln, and an inquest was held on the body of the deceased at the White Hart Hotel, by Dr. G. M. Lowe, deputy-coroner.

In course of the proceedings Mr. Wm. Huddleston, the builder who erected the stand, on being examined by the coroner, deposed: I looked at the stand, which fell on the 24th of March, the evening previously; and on the following morning, before the first race was run, I walked round it. For anything I could observe, the stand was put together in the same way as it had been done from ten to twenty previous occasions. The man who put the stand up in March assisted to do so for five or six times previously. I saw the stand after it fell, and it struck me that some iron bolts were missing, which should have been in. Two or three of the bolts missing would be bolted to a longitudinal piece of timber, placed across the middle part of the principals. The bolts which were missing would be placed in the centre part of the stay.

The Coroner: Do you consider that the absence of these bolts would cause the stand to cant over in the way it did?

Witness: Quite sufficient, and I understand from the parties who were upon the stand that the absence of the bolts was the sole cause of its falling.

The Foreman: You remember, Mr. Huddleston, being called, just before the race, to see a plank that had tilted up?

Witness: I went to get a man to put it right, but before I got back the stand had fallen. I could not say at what time the bolts were removed, as I did not take notice of them when I visited the stand. I trusted to the man whom I employed to see that the stand was properly erected.

The jury, after consulting for about an hour, returned the following verdict:—

"That the said William Cullingworth died from injuries sustained by the fall of a certain stand at Carholme, in the city of Lincoln, upon the 24th of March, 1874, and not otherwise."

To this verdict was appended the following:—

"There is not sufficient evidence to convince the jury that the bolts stated to be missing had ever been put in their places on the occasion in question, and that the Race Committee should not allow any stand to be used upon Carholme in future until it has been carefully examined by a competent person, and certified to be perfectly safe."

The Coroner said that he would convey the recommendation to the Race Committee.

SCHOOL BOARD SCHOOLS.

London.—The Works Committee of the Board invited tenders for the erection of a school to accommodate 748 children, on the Penrose-street, Walworth, site, the amounts being as follows:—

Gammon & Sons	£9,137	0	0
Killby	8,890	0	0
Thompson	8,360	0	0
Tarrant	8,237	0	0
Sheffield	8,175	0	0
Jerrard	8,073	0	0
Cullum	7,640	0	0
Cooper	7,544	0	0

The committee recommended the acceptance of the lowest tender—that of Mr. J. Cooper, of 221, Camberwell-road, S.E., amounting to 7,544*l*. It was added that the above tender includes a provision of 400*l*. for extra foundations which it

has now been ascertained will be necessary; and also a provision of 650*l.* for tar paving and boundary walls. [Cost of site, so far as purchased, 2,867*l.* 1s. Cost of building, per head, 10*l.* 1s. 8d.] The committee also invited tenders for the erection of a school to provide accommodation for 789 children, on the site in Walnut-tree-walk, Lambeth, the following being the respective amounts:—

Brass	£6,815	0	0
Manly & Rogers	6,630	0	0
Downs & Co.	6,560	0	0
Clarke & Bracey	6,542	0	0
Perry & Co.	6,500	0	0
Kelly, Brothers	6,500	0	0
Tyerman	6,440	0	0
McLauchlan	6,416	0	0
Scrivener & White	6,274	0	0
Crockett	6,258	0	0
Howard	6,195	0	0
Hill, Higgs, & Hill	6,164	0	0
Jerrard	6,049	0	0

The committee recommended the acceptance of the lowest tender, that of Mr. S. J. Jerrard, of Homesdale, Lewisham, amounting to 6,049*l.* [Cost of site, 6,073*l.* 13s. 6d. Cost of building, per head, 7*l.* 13s. 4d.] On the motion by Mr. Currie that the tender be accepted of Mr. J. Cooper, for the Penrose-street Walworth School, Mr. Gover remarked upon the exceptionally high cost per head. Mr. Currie said the cost per head was increasing and would increase. A pressure was being put upon the Board by new members for covered ways, for more convenient accommodation for teachers who lived at a distance from the school, &c. Then there was an increase of 20 per cent. on building. Canon Cromwell mentioned a recent case of a voluntary school well and substantially built, which cost only 5*l.* per head. Mr. Freeman remarked that opinions differed as to what school buildings ought to be. Some gentlemen seemed to think that a place would do for a school which was hardly fit for pigs. He would contend that the School Board buildings must almost necessarily be more expensive than ordinary voluntary schools. Rightly or wrongly, the Board put up buildings of a better appearance, and buildings that would be a credit to the London School Board. The Board gave 1 ft. more room per head than other schools, and that considerably increased the expense. The Board schools were more massive and durable; they were built to stand for ever. Mr. Murphy observed that at Leeds he had recently seen a Board school which cost 11*l.* per head. Mr. Currie stated that up to the present buildings had been provided by the Board for 50,000 children, and the gross cost, including building and furniture was 12*l.* per head; the building and furniture, cost 8*l.* 10s. per head. But he could not hold out a hope that in the future the Board would be able to keep within that limit. The motion was agreed to. —— At the last meeting of the Board Mr. Currie brought up a report of the Works Committee, which says:—On the 13th of November, 1872, the Board accepted the tender of Mr. T. Ennor, amounting to 1,375*l.* for the adaptation of the Rice-mills in Berner-street, Whitechapel, to the purpose of a school, seven years' lease of the premises having previously been acquired. The Board have since resolved to purchase the freehold of the premises, and have scheduled additional land, in order to increase the very limited area of the site. The committee have accordingly obtained a tender from Mr. Ennor for carrying out the necessary alterations and improvements to the school, in order to make it fit for permanent occupation. These alterations include the demolition of the houses scheduled, the erection of a screen-wall along the front of the site; the provision of a stone staircase, as required by the district surveyor, instead of the wooden one at present in existence; the insertion of new windows in the front wall; and the paving of the additional ground. The committee recommend the acceptance of the tender of Mr. Ennor, amounting to 1,195*l.* The committee have invited tenders for the erection of an infants' department for the High-street, Stoke Newington, School, to provide accommodation for 100 children. The following are the respective amounts:—

Belham & Co.	£1,334	19	2
Hook & Oldrey	1,095	0	0
Parsons, Brothers	988	0	0
Ennor	985	0	0
Boyce	984	0	0

The committee recommend the acceptance of the lowest tender, that of Mr. Boyce, of London-road, Hackney, E., amounting to 984*l.* On the motion of Mr. Currie, the recommendations of the committee were agreed to.

Liverpool. — The schools erected by the Liverpool School Board in Queen's-road have been opened, and upwards of 200 boys, girls, and infants placed on the school register. Dr. Cross, Mr. Oulton, and Mr. Hance (clerk to the School Board) were present. There was no public opening ceremonial.

South Bersted.—At the last Board meeting, the Rev. A. Conder in the chair, the School Management Committee were instructed to issue notices that the new Central Schools in Lyon-street will be duly opened on June 1st, 1874. The clerk was instructed to inform the Education Department that the Board is about providing accommodation at Shripney, which will include the parish of Aldingbourne.

Stoke-upon-Trent. — The Bagnall School has been formally opened. The chairman remarked that at the two extremes of their district it had been found necessary to erect schools, and at Clayton, nine miles distant, a mixed school for fifty children had been opened in January. At Bagnall the Board was compelled to go to much greater expense in providing school accommodation, since a house for the teacher had also to be built, and the village was not easy of access. The school had been built of stone from the quarry adjoining, and was constructed to accommodate 108 children. He pointed out that the cost was under 10*l.* per head per scholar, the house itself costing 500*l.* for erection.

Norwich.—The Board have adopted a recommendation of their works committee to erect schools at Catton, ordering the plans to be forthwith prepared. The schools are to accommodate 300 boys, 250 girls, and 250 infants, such schools to be each 22 ft. in width, and arranged for four rows of desks, and to be so planned as to admit of future extension sufficient to accommodate (inclusive of the above number) 1,000 children altogether.

OPENING OF THE MANCHESTER AQUARIUM.

THIS new establishment, of which we gave a view and plan, with full particulars, in the *Builder* of 28th February last, was formally opened in time for the Whitsuntide holiday-folks. It is an important addition to the few places of resort enjoyed within easy distance by the inhabitants of Manchester. The new aquarium is well stocked with marine and fresh-water fish. The building, we may repeat, is Italian Gothic in its frontage, with rows of clearstory windows, and roofs at the sides. It stands in front of the large lawn in Alexandra Park, a well-frequented suburb of Manchester. The centre saloon or hall is 150 ft. in length, 40 ft. in width, and from the floor to the ridge of the open-span panelled roof, 54 ft. in height. This saloon forms a promenade. The walls are lined with cases stocked with anemones, and in the centre space there are large glass tanks filled with river and lacustrian fishes. This collection was enriched on the opening day by a score of artificially-hatched "baby" salmon, which Mr. Frank Buckland, who opened the aquarium, had brought down as his contribution towards the undertaking. The corridors on the north and south sides of the building are lined with tanks filled with marine fish and crustaceans, and these large spaces constitute the main scientific feature of the exhibition. By mechanical means the conditions of these tanks are rendered suitable for the different classes of fishes, and the directors claim to have the deep-sea or coralline, the laminarian, and the littoral zones that gird our sea-shores, truly represented in their aquaria,—the ocean current, the tidal wave, ebb and flow, &c. The exhibition tanks present to the spectators a transparent frontage of nearly 750 ft. in length (being more than double that of any aquarium yet constructed). The sea-water is brought by train in barrels from Blackpool, a distance of about forty miles, and a constant supply is maintained.

Fleetwood Dock Works.—Great progress is now being made with these extensive works, and both excavation and building work are carried on with vigour, limited only by a rather short supply of hands. Men in search of a job do not readily find their way here. It is said there is certain employment for nearly three years for 150 more men than are at present on the works, and that lodgings and provisions are both plentiful and cheap. The new dock will be 340 yards long by 134 yards wide.

CHURCH-BUILDING NEWS.

Garston (Liverpool).—An appeal is now being made to the public for funds for the erection of a new parish church for Garston. The building committee state that "the existing parish church provides accommodation for only 250, out of a resident population of 6,000, which is constantly increasing, and which is, moreover, exclusive of a floating population in the dock of about 300." The cost of the building is estimated at 5,000*l.*, of which about 2,000*l.* have been received. It may be stated that although the adjoining districts of Mossley Hill and Speke are being provided with church accommodation through the liberality of private persons, these churches will be too far from Garston to afford it any relief.

Elsham.—The parish church of All Saints, Elsham, near Brigg, has been re-opened by the Bishop of Lincoln, after undergoing a restoration. The fabric is of a very composite character, originally intended for a conventual church. This small church contains in itself all the styles prevalent from the Late Norman to the debased Gothic immediately preceding the Reformation. The restoration has been carried out entirely through the exertion of the owner of the estate upon which the church is situated, Sir John Dugdale Astley, bart., M.P., and consists of a reredos of Caen stone, with insertions of alabaster and coloured marbles, and a font of the same description, an oak communion-table, covered with an embroidered frontal, chancel stalls of oak, an encaustic tile floor in the chancel, an organ by Bevington, with a decorated exterior, and a division made between chancel and nave by means of a low screen, surmounted by a traceried arch in wood. The seats in the nave are of pitch pine, with ornamental piercings in the bench ends. The east window has been filled with stained glass, by Mr. Tarleton Cleobury, of London, the subject of the centre compartment being "The Reception of the Little Children by Christ"; in the side-lights "The Resurrection and Ascension." This was erected by Sir John and Lady Astley, as a memorial to a departed child. The reredos, pulpit, and font were the work of Mr. Earp, of London; the brass-work by Messrs. Jones & Willis; the altar-cloth by Mr. Brangwyn, of London: all from the designs of the architect. The builder was Mr. Wallis, of Market Rasen; and the whole of the works have been carried out from the designs and under the superintendence of the architect, Mr. William Scott Champion, of London.

Lowestoft.—At a vestry held in Kirkley church, the plans prepared by Mr. J. L. Clemence, for the enlargement of this edifice, were submitted. The architect explained that the enlarged building when completed would seat about 600 persons, the present church seating but 200. The estimated cost of the proposed alterations and improvements were stated at a rough guess at 2,000*l.* The plans having been adopted, a committee was formed, with power to add to their number, for carrying out the plans for the proposed rebuilding and enlargement. We understand that the promised subscriptions to the rebuilding fund amount to over 860*l.*, and that the patron of the living has promised to erect the chancel.

Knutton.—A new church at Knutton, the foundation stone of which was laid by Mrs. Sneyd, of Keele Hall, in August, 1872, has been consecrated. Silverdale village now comprises a population of nearly, if not quite, 7,000, and at the end of the township of Knutton, furthest removed from Silverdale church, is springing up another village known as New Knutton. The new church is designed for the inhabitants of this latter place. The church, which is of the Early Decorated period of architecture, of plain character, consists of nave, 64 ft. by 25 ft., north aisle, chancel, 30 ft. by 20 ft., organ chamber, vestry, and south porch, and will accommodate 383 persons. It is so constructed that a south aisle may be added at some future time, should the requirements of the place necessitate enlargement. There is a bell turret with one bell on the west gable of the nave. The walling generally is of Alton stone. The roofs are open-timbered, and are covered with Staffordshire tiles. The seats are open benches of pitch pine; the floors are laid with Minton's tiles. The church is heated by hot water, by Mr. Walker, of Manchester. The cost of the church (about 4,000*l.*), together with the new schools and master's house, has been defrayed chiefly by private subscription. The church has been erected from the designs and under the superintendence of Messrs. T. Lewis & Son, of New-

castle, by Mr. N. Bennett, of Burslem, Mr. R. Twemlow being the clerk of the works.

Bilston.—Holy Trinity Church, Ettingshall, having been rebuilt, has been re-opened for Divine service by the Bishop of Lichfield. The building is in the plain Early English style, and consists of nave, north aisle, chancel, and transepts, with an organ-chamber; and a vestry on the north side of the chancel. The material is Gornal stone, with Bath stone dressings; the roof open timbered. The total length of the building is 90 ft.; the nave 25 ft. wide; the chancel and transepts each 20 ft. There is accommodation for 500 persons, including 147 children. The spire has yet to be added when the funds are forthcoming. The total cost at present incurred is 2,760*l.* Mr. Griffin is the architect, and Mr. Horsman the builder, both of Wolverhampton.

Woodgreen (London).—The church of St. Michael and All Angels, Bowes, Woodgreen, has been consecrated by the Bishop of London. The church is a plain building, in the Gothic style, with chancel, nave, and two aisles. It is about 110 ft. long and 60 ft. wide, and will accommodate 650 persons. Its cost was about 6,000*l.* There is a stained-glass window in the chancel, given by Mr. Samuel Page, of Chitt's-hill, Woodgreen. Alderman Thomas Sidney, whose mansion, Bowes Manor, is very near, gave the site, and a large sum of money—in fact, nearly the whole—towards its erection, and a piece of ground adjoining it has been assigned and consecrated as a site for a tomb or mausoleum for the alderman and his family. The architect of the church is Sir Gilbert Scott, and the builder is Mr. Foster, of Whitefriars; Mr. J. S. Lee, of Woodgreen, being the surveyor.

VARIORUM.

IN addition to *Debrett's Peerage* and *Debrett's Baronetage* for the year already noticed, we now have *Debrett's House of Commons* and *The Judicial Bench* for 1874. It appears to have been most carefully compiled and edited by Dr. R. H. Mair, and changes up to the end of March are noted. Giving the history of the new Parliament, it contains a very large amount of new and interesting matter, and must have involved a great deal of labour.—The new number of the *Leisure Hour* says, as to the Portsmouth Soldiers' Institute:—"The old 'Fountain' Hotel at Portsmouth, for nearly 300 years the great resort of naval officers, the scene of 'Peter Simple's' adventures, has now been purchased for a 'Soldiers' Institute' through the exertions of Miss Robinson, who will personally superintend it. Of late years the 'Fountain' has been a den of iniquity, only equalled perhaps by the 'Blue Posts,' burnt down a short time since. Our troops are tempted by more than a thousand gin-shops and public-houses, with dancing-saloons and other worse haunts in this garrison, and have no respectable place of resort. The purchase and transformation of the 'Fountain' will cost 6,000*l.*, of which 4,500*l.* are already subscribed. It will not be difficult to complete this sum, and we only hope that enough in addition will be at the disposal of the trustees and committee to enable the new club to be made comfortable and attractive."

Miscellanea.

Ancient British Remains at Ilkley.—Some sepulchral remains have been found at Ilkley. Messrs. Robinson & Sons commenced excavating for a new block of buildings east of their cabinet works in Cowpasture-road, near to the Midland Railway Station. The workmen, in digging out for the foundation, discovered, about 3 ft. deep, several circular walls of rough stones, covered over with slabs of stone about 9 in. across. The hollows contained urns filled with spent charcoal and calcined bones. The excavators also came upon a rude vault lying east and west, and of a rectangular form, covered with a thin stone slab. The sides were built of rough sandstone, without mortar,—depth, about 1 ft. On removing the top covering, there appeared the ancient outline of a human form, as if embedded in ordinary brick clay. In the earth thrown out various jet ornaments were found. A portion of grit stone of a much harder texture than any found around Ilkley was also turned up, which appeared to be part of some rude statue.

Cookery for the Million.—A public meeting of the supporters of the National Training School of Cookery has been held in the great room of the Society of Arts, the Duke of Westminster in the chair. The report of the executive committee stated that they had undertaken to prepare a scheme for a permanent training-school. They had made additions to their number, and now consisted of the following:—The Hon. E. F. Leveson-Gower, M.P., chairman; Viscount Barrington, M.P., Sir Daniel Cooper, Bart., Mr. F. B. Alston, Mr. James Bateman, F.R.S., Mr. Henry Cole, C.B., Lieutenant-Colonel E. F. Du Cane, C.B., R.E., Captain Hans Busk, LL.D., and Mr. J. M'Gregor, M.A. The Duke of Westminster said the scheme of the committee had been very successful so far as it had gone. The school was now self-supporting. The waste of food was as great relatively in small houses as in large ones. It was said that the French refugees had repaid us for hospitality by teaching us the use of ox-tails, and he hoped some other "ox-tails" would be found out. He thought the committee had had good luck in meeting with Lady Barker. Earl Granville moved:—"That an appeal be made to all corporations, benevolent, and educational institutions, and the public generally interested in promoting the preparation of food among all classes in the best and most economical manner to place on a permanent foundation a National Training School of Cookery." The resolution was carried unanimously. The Right Hon. Cowper-Temple moved that the following be the vice-presidents for the year, with power to add to their number:—The Archbishop of York, the Duke of Sutherland, the Duke of Beaufort, the Marquis of Lorne, the Earl of Derby, Earl Granville, Earl Cowper, Earl Brownlow, the Earl of Dartmouth, Lord Carington, Lord Wharncliffe, Viscount Barrington, Hon. E. F. Leveson-Gower, Sir Daniel Cooper, Mr. R. C. Browne Clayton, Mr. C. J. Freake, Earl Spencer, and Mr. T. Brassey, M.P. He said England was pre-eminent in the production of good food, but was totally behind other countries in the mode of preparing the food. He thought the time was coming when there would be a general feeling of thankfulness for the initiation of this movement. The motion was supported by several other speakers and passed.

Typhoid Fever and its Prevention.—At the last meeting of the Association of Medical Officers of Health, Professor Corfield, M.D., medical officer for St. George's, Hanover-square, gave an address on "The Prevention of Typhoid Fever." Enteric or typhoid fever, the lecturer said, was a disease of the same class as scarlet fever, smallpox, and the like diseases. They were all contagious, directly and indirectly; and if enteric fever was only occasionally propagated in this way, the reason is because the poison is in great part swamped in a mass of liquid, the discharge from the bowels, and is not, to a great extent at any rate, given out into the air from the skin, lungs, &c. We are told that the discharges in question do not contain the poison when they are fresh; but that it may be developed during their decomposition. Dr. Corfield held that this was an error, and a mischievous one, as it discouraged persons from attempting to destroy the poison by disinfecting the discharges from the patients. The waste-pipes of drinking-water cisterns should end in the open air, and not in drains, as they so frequently do; this he considered, from many facts which had come before him, to be the chief cause of the spread of typhoid fever in London, for the sewer-air, which sometimes contained the poison, came up the wastepipe and contaminated the drinking-water. In the discussion which followed there was a general consensus of opinion, that the disinfection of the discharges from the patients were most important to prevent the spread of the disease.

A "Steeple Jack" in Edinburgh.—Some one under this new generic title has been engaged on the top of the tall column in the works of the Edinburgh Gas Company, examining the state of the structure with a view to its immediate repair. It seems that part of the stalk near the top has been split in several places by lightning, and it will be necessary to make good the damage by encircling the brickwork with iron hoops. The "Steeple Jack," in order to reach the summit, had recourse to the usual method of flying a kite over the column, which is upwards of 320 ft. in height, and then drawing himself up by a rope, to the free end of which a couple of 56 lb. weights were attached.

Manures Natural and Artificial.—This was the subject of a lengthy paper read before the members of the Tunbridge Wells Farmers' Club, by Mr. W. F. Catcheside, F.C.S., Mr. T. B. Lansdell, the President of the Club, occupied the chair, and there was a numerous company of farmers in attendance. In treating of the natural manure of the farm, Mr. Catcheside said he would suggest that a farm-yard should be built on a plan resembling a very flat funnel. The yard should slope very gently in all directions, where a tank or well should be built large enough to store a good amount of liquid. This must be fitted with a pump, and the liquor pumped over the yard in dry weather, thereby adding to the strength of the manure in the middle of the yard, and also of the liquor. Where the cattle feed he would have good slate roofs properly spouted. The rain-water he would conduct to tubs, as it was always useful, the excess or overflow going down a drain. He then treated of artificial manures, and concluded with an earnest appeal to farmers to become more acquainted with the nature of soils and manures. A long discussion ensued.

"The Biggest Thing on Earth."—New York has had a real sensation in the world of amusement. The Great Roman Hippodrome, which Barnum announced some time ago, is completed, opened, and described in the local papers. Everybody who had stared with amazement at the enormous structure so rapidly spreading itself over the entire block between Madison and Fourth Avenues on Twenty-sixth-street desired to get into it when it was opened. A private rehearsal was attended only by about 6,000 people, but at least 50,000 desired to be admitted. The hippodrome or circus seats 12,000. It encloses a space inside the track that is 84 ft. broad and 270 ft. long, and the track itself, laid out in an ellipse, is one-fifth of a mile in length. Rising nearly 20 ft. all round it are the seats for the spectators, divided by grades of upholstery, into gallery, dress circle, parquet, &c. Filled as it was by an assemblage of 10,000 or 12,000 persons, and brilliantly lighted by hundreds of gas-jets, the scene was one of great interest.

Soot and Sugar in Corrosion of Iron.—At a meeting of the Manchester Literary and Philosophical Society, Mr. E. W. Binney exhibited some portions of the roof of the railway station at Salford, which, after being in place four years, was so much corroded that it had to be taken down. The sulphuric acid, and soot, from the combustion of the coal used in the locomotives, were named as the probable causes of this. About the sulphuric acid there can be no doubt, but as to the soot it is not so clear; carbon is used in crucibles to prevent corrosion or oxidation of metals. An iron ship, however, recently sank at sea, "through the action of sugar [it is said] upon her iron plates, producing rapid decomposition." The iron could not to be thus or in any way *decomposed*; but the carbon of the sugar, or the soot, might *combine* with the iron and destroy it as good iron, reducing it to something like pig, or disintegrating it altogether.

Birmingham Builders.—The dispute between the builders of Birmingham and their labourers has been settled by Mr. Rupert Kettle, who accepted the invitation given by both parties to arbitrate in the matter. The labourers asked for an advance from 4¾d. to 5½d. per hour, and after full discussion and a hearing the arbitrator made the following award:—

"Upon the distinct understanding that all conflict in the trade between the employers and the labourers shall cease, and that on the one hand the men now at work be not interfered with, and that on the other hand the men lately on strike be taken into employment as occasion requires, without regard to conduct during the strike, and that the rules worked under for the future be the rules settled by me on May 1, 1872, except that notice for a change be given on the 1st November instead of on the 1st December in any year, and that changes come into operation on the 1st April instead of on the 1st May, the other times as to notice being altered to suit these dates, I award that the wages of the labourers in the building trade in Birmingham be raised from to-day to the rate of 5¼d. per hour."

At the close of the proceedings a vote of thanks to Mr. Kettle was unanimously passed.

The Caterham Lime and Chalk Quarries.—The Caterham Lime and Chalk Quarries are about to pass into the hands of a company, which is now in course of formation. These quarries, which are conveniently situated, close to both the London and Brighton and South-Eastern Railways, and about thirteen miles from London, are said to produce lime and chalk of excellent quality, for building and other purposes. The capital of the company is 20,000*l.*, in 5*l.* shares.

"Fighting in the Ashantee Forest."—Not content with having given numerous excellent illustrations of the late Ashantee war during its progress, the spirited proprietors of the *Illustrated News* commissioned Mr. Louis Desanges, immediately on the close of it, to paint a large picture, 14 ft. by 10 ft., conveying features of the most striking characteristic of the war,—fighting in the bush. The "Black Watch" play a prominent part; Sir Garnet Wolseley and other officers have given Mr. Desanges sittings: he was, further, aided by the sketches of the artist who went out for the *Illustrated News*, Mr. Melton Prior, and the result is a most interesting work of national interest and importance. Various drawings and Ashantee relics aid in rendering the exhibition of Mr. Desanges' picture at Willis's Rooms attractive; and all we have to regret is the want of sufficient light to show the picture to advantage.

The Maidstone Surveyorship.—At the last meeting of the Town Council, the Mayor said that while he rejoiced in the appointment of Mr. Livingstone, their surveyor, to a situation more lucrative than the one he held here, he could not help acknowledging the services he had rendered, and regretted exceedingly losing him. He said this in his capacity as Mayor. The Surveyor, after thanking the Mayor for the compliment he had paid him, respectfully tendered his resignation. The reason of his resigning his present office was because he had received a good appointment in London, having been appointed the Surveyor of the parish of St. George's, Hanover-square. There had been eighty candidates for the office. Twelve of their number had been selected to appear before the committee, and this number had eventually been reduced to six, and he had been appointed by 55 votes against 10.

The Steam Thrasher. — At the Flemish Farm of her Majesty, at Windsor, is a steam thrashing-machine, worked by a supply of waste straw to the furnace through a self-acting apparatus, which is the joint invention of Mr. John Head and of Mr. Schemioth, a Russian engineer. The engine is worked to its full power by an average consumption of straw equal to four times the usual weight of coal. This is considered to be a highly important invention for such prairie countries as those of Russia and America, where, in wide districts, neither coal nor wood can be had. The Emperor of Russia was driven to the farm by her Majesty, on the day after his arrival, to see the machine, and the Grand Duke Alexis carefully examined it, and is said to have highly approved of it; as, however, the most competent agricultural authorities are said already to have done. It was exhibited at Vienna.

Birmingham and District Architectural Association.—Last week the members of this association visited the works of the restoration at St. Martin's Church, under the conductorship of the architect, Mr. J. A. Chatwin. The architect first described, by means of drawings, the church as it was originally, and at the time when it was cased with brickwork in the days of Charles II., and finally as it was, before the works of restoration now in progress were commenced. He afterwards exhibited and described the drawings illustrating the present restoration, and conducted the members over the works. After having passed a vote of thanks to the architect, the members dispersed themselves over the building, under the care of Mr. Geen (the clerk of the works), to study it at their leisure, and to examine the various relics of the ancient edifice.

Restoration of Nether Hall, Pakenham, Suffolk.—For some months past, works of an extensive character have been in progress at Nether Hall. The architect was Mr. P. Webb, of Gray's-inn. The plans were submitted to several builders in Bury, the result being that the work was placed in the hands of Mr. A. Andrews, who has thus far carried out the contract. The work having now made considerable progress, the proprietor, Mr. Greene, gave an entertainment to all Mr. Andrews's men, as a mark of appreciation of their skill, energy, and good conduct: and the entertainment took place in the spacious carpenters' shop, where a company numbering upwards of 150 sat down to a substantial repast. Mr. W. Pead occupied the chair, and was faced by Mr. George Sparke as vice-chairman. Among the guests were Mr. J. Kennedy, clerk of the works, and Mr. C. G. Vinall (Goodman & Vinall, architects, London).

Bere Regis Church, Dorset.—The church of Bere Regis is in an extremely dilapidated condition, and a committee has been formed for the purpose of carrying out the restoration of the nave and north aisle. Mrs. Lloyd Egginton, the chief proprietor of the parish, has undertaken to restore the chancel and south aisle at her sole cost. A portion of the church belongs to the Transitional Norman period, but is assigned by tradition to King John, who is said to have frequently visited the Royal Forest and Palace which stood, until recent times, in close proximity to the church. The nave roof is bold and striking, and has an historical interest, as being connected with the memory of Cardinal Morton, one of the patrons of architecture during the fifteenth century. The cost of the required works is estimated at 3,870*l.*

New Hospital and Infirmary for Warrington.—The building committee to whom have been entrusted the carrying out of the arrangements connected with the erection of a new hospital and infirmary in the park, met at the dispensary, as reported in the local *Guardian*, in consequence of the medical committee having advised that the proposed site was unsuitable. The medical committee had prepared a report setting forth their views, but as the plans and specifications were completed, and the committee were on the eve of inviting tenders for the erection of the hospital, they decided not to receive the report, but to convene a meeting of the general committee and directors of the dispensary, so as to enable the medical committee to make any statement they wished in regard to the site.

The Indestructible Paint Company.—For the Preservative Solution which this Company sell, they claim, 1, that it is colourless and invisible; 2, in no way does it alter the appearance of the surface; 3, it prevents the growth of vegetation; 4, it renders stone, &c., impervious to moisture; and 5, that it resists the action of the atmosphere and changes of weather, not only preventing but also arresting decay. If they can establish these assertions, their fortune is made, and a great *desideratum* supplied. The fact that this composition is extensively used in the restoration and renovation of St. Paul's Cathedral, under the superintendence of Mr. F. C. Penrose, says a good deal in favour of it, and moreover affords an opportunity to those who desire to watch the effect of time upon it.

"Down with the Dust."—According to the *Scientific American*, Mr. C. F. Loiseau has disposed of his right to manufacture artificial fuel from coal-dust in Great Britain, under his English patents, for the sum of $60,000 gold, and a royalty of 25 cents. per ton, when coal sells at from 15s. to 25s. per ton in London, the royalty varying with the price above or below these figures. The purchasers agree to manufacture a minimum amount of 100,000 tons the first year, and after that to keep the market supplied, on failure of which the inventor can manufacture for himself. This at the beginning, supposing coal to sell at the above figures, would give the inventor the neat income of $25,000 for the English market alone. Mr. Loiseau is organising a company for the manufacture of the fuel in the United States.

A New Danger to Wine Drinkers.—The ordinary processes of adulteration, remarks the *Globe*, are not the only source of danger to which wine-drinkers are exposed. It appears that a poison lurks in the bottles as well as in the wine. At a recent meeting of the Académie des Sciences, M. Fordos denounced the mode in which bottles are cleaned, by rinsing them out with small shot. He has discovered that by this process a carbonate of lead is formed, and this attaches itself so firmly to the inside of the glass that it can only be removed by the action of acids. Thus it happens that acid wines, which are by no means uncommon, dissolve the lead, and the wine-drinkers take the hurtful mixture. Instead of lead, M. Fordos proposes that iron should be used.

Hospitals and Ventilation.—Amongst the subjects to form the exhibition arranged by the British Medical Association, at their approaching meeting in Norwich, are "Drawings, Diagrams, or Models illustrating the Ventilation of Hospitals and Private Dwellings." We are asked to invite the contribution of models and diagrams of this kind. Communications may be addressed to Mr. C. Firth, St. Giles-street, Norwich, the Secretary for the Museum Department.

The Opening of Parliament-street.—In reply to Lord Redesdale on this subject, the Duke of Richmond said it was one of the first which occupied the attention of his noble friend at the head of the Department of Public Works. There was no ground for the suggestion that the delay in the completion of the present undertaking was due to any dread on the part of the department that they might be called upon to go farther and pull down more houses in order to complete the improvement. There had been no cessation of the works. Sewers had to be made, and gas and water mains laid before the roadway could be made. These were now in progress, and he hoped that in no long time the work would be completed.

Lichfield Industrial and Loan Exhibition. An exhibition of works of art and industry has been opened at St. James's Hall, Lichfield, with appropriate ceremonial. The exhibition had its origin in a desire to assist the art class formed in Lichfield in connexion with the Department of Science and Art, and the primary ideas on the subject have undergone considerable expansion. The local gentry took up the subject in a friendly spirit, placing their collections at the disposal of the committee, and the consequence is, says our authority, the *Staffordshire Advertiser*, that the exhibition is one to be warmly commended to the patronage of all who, in these days of cheap travelling, live within (say) fifty miles of Lichfield.

A Hindoo Workman.—A famous Hindoo artizan, named Bhawoo Ballajee, has died in Bombay. He constructed numerous model locomotive engines, and made an important improvement in the native mode of manipulating gold and silver thread. Formerly the thread was beaten flat with a hammer and then stretched. Bhawoo, however, invented a machine in which the thread passed between two steel rollers, and thus turned out "all of a sort." He also succeeded in making iron water-cocks, having a coating of brass, thereby reducing their cost from 29 rs. to 9 rs. His savings amounted to 30,000 rs., a third of which was unfortunately lost during the cotton mania.—*Friend of India.*

Proposed Memorial of Archdeacon Paley. Another effort is being made—and this time with a good prospect of success—to erect in Carlisle Cathedral some worthy memorial of Archdeacon Paley. It is suggested that as all the larger windows of the cathedral are already filled with stained glass, "a handsome stone pulpit, with a suitable tablet, would perhaps form the most fitting memorial of Paley's great service to the cause of religion, and of his connexion with the cathedral and the diocese of Carlisle." The Rev. Canon Prescott is the treasurer of the fund, and it is hoped 500*l.* may be raised. More than half has been subscribed.

Death of Mr. T. Bell, C.E.—Mr. T. Bell, the local engineer of the Bristol Water Works since the foundation of that concern, is dead. Mr. Bell was originally in the office of the late Mr. Simpson, hydraulic engineer. When the latter came to Bristol to project water-works, Mr. Bell was selected by him, on account of his intelligence and energy, to carry the plans into execution. Since then he has been local engineer to the company, and has carried out all the extensions and alterations. Previously to his coming to Bristol, he was engaged on water works at Nottingham. The cause of his death was disease of the heart.

Builders' Liabilities. — Edmund Parsons, builder, was summoned at the instance of the Wandsworth Board of Works. Mr. Corsellis, clerk to the Board, supported the summons. Mr. Arthur Southam, assistant surveyor for Clapham, said the defendant had been building at the rear of Roundell-street, Clapham, and his carts had cut up the footpath, doing damage to the amount of about 8*l.* Defendant's foreman now promised that the footpath should be made good, and Mr. Ingham ordered an adjournment. A similar complaint was made against Messrs. Taylor & Partridge, who were dealt with in a similar manner.

Proposed New Workhouse for Sheffield.—Mr. Basil Cane, Government Inspector, met the House Committee of the Sheffield Union on the subject of a new workhouse. The inspector referred to the over-crowded, badly-ventilated state of the present building, and urged that the time had come when more commodious premises should be obtained.

The New Corn Exchange at Cambridge. The Cambridge Corporation are about to erect a new corn-exchange, the foundation-stone of which was recently laid by the Mayor of Cambridge. It will form a room 168 ft. long by 55 ft. wide, and 60 ft. high to the ridge. On the south side there will be a transept 48 ft. long by 28 ft. wide. The whole will allow space for 220 merchants' desks, without crowding, and the cost is put down at 6,000*l*. The architect is Mr. R. R. Rowe, of Cambridge, and the builder Mr. Elworthy, of Wisbech.

Proposed Erection of 209 Houses at Otley.—A company of gentlemen belonging to Bradford have purchased a large quantity of land in Gay Lane and Cambridge, Otley, on which they propose to erect 209 cottages and houses. The plans of the proposed property were submitted to the Otley Local Board on Wednesday night by Mr. Morley, architect, Bradford, and were approved. The houses, when completed, will be let for 25s. a month, and in the course of a number of years the house becomes the property of the tenant. Already a large number of the houses is bespoken.

Landslip at Temple Bar.—During the last few days the contractors for the building of the new Law Courts have taken a portion of the front cellar attached to the "Haunch of Venison" public-house, Bell-yard, Temple Bar, and excavated up to the cellar. They had shored up the public-house. A subsidence of the footway at the Fleet-street end of Bell-yard occurred, which extended to nearly one-half of the width of the thoroughfare, and for several yards in length north and south. The traffic was stopped, a bar being erected across Temple Bar end of the yard, and police placed on duty.

The Polytechnic, Regent-street.—We are glad to hear that the managing director, Dr. Croft, is about to arrange a series of lectures at the Polytechnic upon instructive subjects. These lectures will be delivered on Saturday mornings, by competent professors, and will form part of the programme, all the apparatus of the Institution being made available for the purpose of illustration.

Pugin *v.* Molloy.—We are asked by the plaintiff to publish a letter from his solicitors, which asserts that the award recently made by Mr. Turner "fully vindicates his position." We have, however, received a letter at the same time on the part of the defendant, which puts a different face upon it. As we cannot open our pages to a controversy on the subject, we prefer to print neither of the letters.

Another Public Park for Sheffield.—The Page Hall estate, of 140 acres, has been sold by auction, and Mr. Mark Firth, a past master cutler, and already a considerable benefactor to Sheffield, is the purchaser, for 25,550*l*. It is understood to be Mr. Firth's intention to set apart a portion of the estate as a public park, and to present it to the town.

St. Helen's, Bishopsgate.—A writer points out that the well-known monuments of Sir John Crosbie (circa 1475) and of Sir Julius Cæsar, Master of the Rolls under Queen Elizabeth, in the Church of St. Helen, Bishopsgate, the latter the work of Nicholas Stone, are just now exposed, and calls for some interference to prevent injury to them.

The Burning of the Dead.—Under the title of "The Cremation and Urn Society, Limited," a company has been registered in London, with a proposed capital of 50,000*l*., for the purpose of carrying out the necessary arrangements in connexion with the process of cremation.

Value of West-End Property in London.—The important freehold mansion in Burlington Gardens, facing the University of London, so long occupied by the late General the Hon. H. F. C. Cavendish, with the residence adjoining, was sold by auction on Thursday, by Messrs. Rushworth, Abbott, & Rushworth, for 38,000*l*.

The Dover Bathing Establishment and Aquarium.—We are asked to state that Messrs. Nelson & Harvey, of Whitehall, are joint architects in this matter with the gentlemen previously mentioned.

City Street Improvement.—The Metropolitan Board of Works have resolved to contribute 370,000*l*. towards a new street from King William-street towards Fenchurch-street.

TENDERS

For the erection of the Royal Seamen and Marines Orphan Schools, Portsmouth, exclusive of cost of bricks, which will be supplied from H.M. Dockyard Extension Works. Mr. T. Dashwood, architect. Quantities by Mr. Francis Newman:—

Meader	£7,350	0	0
Norris	7,145	0	0
Burbidge	6,650	0	0
Morey	6,448	0	0
Rapley & Son	6,359	10	0
Roberts	6,350	0	0
Light	6,295	0	0
Cooper	6,188	0	0
Quick	6,169	0	0
Laurence	6,070	0	0
Barnes	5,979	0	0
Barton	5,900	0	0
Ward (accepted)	5,686	0	0
Smith	5,300	0	0

For additions and alterations to house at Crowthorne, Berks, on the Wellington College Estate, for the Rev. J. W. Spurling, M.A. Mr. Edwin Clare, architect. Quantities supplied by Messrs. Waymouth & Sons:—

Merritt & Ashby	£2,025	0	0
Dove, Brothers	1,975	0	0
Killby	1,950	0	0
Fish	1,880	0	0
Hill, Higgs, & Hill (accepted)	1,800	0	0

For alterations and additions to premises, Great Alie-street, for Mr. L. Silverberg. Mr. Charles Reilly, architect:—

Harrison & Son	£4,987	0	0
Heeps	4,149	0	0
Turner & Sons	4,095	0	0
Kiddle & Sons	4,075	0	0
Ashby & Sons	4,031	0	0
Allen & Son	3,981	0	0
Newman & Mann (accepted)	3,546	0	0

For new hop stores at the Griffin Brewery, Chiswick, for Messrs. Fuller, Smith, & Turner, Mr. Geo. More, architect:—

Rivett	£1,383	0	0
Little	1,289	0	0
Adamson & Son	1,089	0	0
Bangs & Co.	986	0	0
Ironfounder's Work.			
Head	£530	0	0

For alterations at the Brown Bear, Worship-street, Bishopsgate, for Mr. M. Ullmer. Mr. Edward Brown, architect:—

Higgs	£637	0	0
Jago & Griffiths	635	0	0
Pringle	575	0	0
Marr	558	0	0
Palmer	525	0	0
Cook (accepted)	472	0	0

For new schools, Barnet-street, Hackney, for the School Board for London:—

Dove, Brothers	£6,495	0	0
Williams & Son	6,350	0	0
Goodman	6,322	0	0
Hook & Oldry	6,095	0	0
Hill, Higgs, & Hill	5,984	0	0
Grover	5,965	0	0
Ennor	5,805	0	0
Nightingale	5,793	0	0
Sheffield	5,626	0	0
Parsons, Brothers	5,610	0	0

For a new school and residence at Little Stukeley, Hunts. Mr. Robt. Hutchinson, architect:—

Howard	£525	0	0
Lord	507	0	0
Machin	502	0	0
Edey &	495	0	0
Allen	480	0	0
Smith	480	0	0
Maile	467	16	0
Richardson	451	0	0
Cade	445	0	0

For alterations and additions to Huntingdon Race Stand. Mr. Robt. Hutchinson, architect:—

Edey & Wildman	£380	0	0
Howard	350	0	0
Maile	345	17	0
Richardson	344	0	0
Balmer	340	0	0
Cade	315	0	0
Lord	307	0	0

For a farmhouse and offices at Wistow, Hunts. Mr. R. Hutchinson, architect:—

Brown	£1,165	0	0

TO CORRESPONDENTS.

Old London in Maps (next week).—"Causes of Art" (in type).—J. L.—G. B.—P.—T. D.—E. J.—T. B.—M. P.—F. W.—B. L.—B.—W. J. O.—J. G. M.—E. P. & Co.—P.—A. V.—E. L.—E. J. F.—J. C. M.—R. H.—Mr. C.

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